The RUBBER AGE

September, 1944

TECHNOLOGY DEPT.

PUBLIC LIBRARY
OCT 1 1944
DETROIT

SYNTHETIC RUBBER LATEX
COMPOUNDING

We can supply complete vulcanizing dispersions ready to mix with different types of Synthetic Rubber Latex. These are properly prepared by ball mill grinding in water.

Aqueous dispersions of separate compounding materials are also available.

We would be glad to have inquiries for the materials you need.

R. T. VANDERBILT CO., Inc.
230 Park Avenue, New York City

Newsletter No. 9
SEPTEMBER, 1944

Published by Rubber Chemicals Division of DU PONT

NEOPRENE

THE MOST VERSATILE SYNTHETIC RUBBER

NEOPRENE has the strength and adaptability of crude rubber and is flame, oil, heat and age resistant.

NEOPRENE LATICES have replaced natural latex in nearly all applications—generally with better results.

SOLID TYPES

Neoprene Type GN-A

All-purpose type, comparable to Type GN, with improved processibility.

Neoprene Type E

Limited use for specialties.

Does not progressively soften with prolonged milling.

Neoprene Type CG

Primarily for quick-setting, high bond strength adhesives.

Provides greater stiffness in uncured stocks.

Neoprene Types FR and FR-S

Freeze-resistant—for very low temperature service and maximum resilience.

Neoprene Type KNR

For troweling putties and paints used in tank linings and protective surface coatings.

For preparing easily processed, highly loaded stocks.

LATEX TYPES

Neoprene Latex Type 571

50% Solids.

All-purpose latex for general use.

Neoprene Latex Type 571 Concentrate

60% Solids.

For general use where high solids are required.

Minimum of odor.

Neoprene Latex Type 60

59% Solids.

For special applications.

Especially suited for froth sponge.

Neoprene Latex Type 572

50% Solids.

A fast-setting, high wet strength latex for adhesives.

●

BACK THE ATTACK
WITH WAR BONDS

DU PONT

RUBBER CHEMICALS DIVISION

BETTER THINGS FOR BETTER LIVING . . . *Through Chemistry*

THE RUBBER AGE, published monthly by The Palmerton Publishing Co., Inc., Printing Office, East Stroudsburg, Pa. Editorial and Advertising Offices at 250 West 57th Street, New York 19, N. Y. Entered as second class matter October 20, 1933, at the Post Office at East Stroudsburg, Pa., under the Act of March 3, 1879. Subscription in United States, $3.00 a year; Canada, $3.50; Foreign, $4.00. September, 1944, Vol. 55, No. 6.

Keeping Our Customers Posted

WIDELY distributed to interested technical executives, the Hycar Blue Book is designed to keep our customers fully informed on the latest developments in Hycar compounding and processing. Supplemental material to be furnished from time to time may be easily inserted in the various sections and groupings within the loose-leaf binder.

With the rapidly expanding application for Hycar Synthetic Rubber, this added customer service is of real value to our many Hycar users.

Paper shortages, we regret, make it necessary to limit distribution to a certain extent. However, every effort will be made to fill all requests for the Blue Book to meet the actual requirements of Rubber Companies and organizations directly serving the Rubber Industry.

Our technical service staff is available to help solve any of your special problems not fully explained in the Blue Book. *Hycar Chemical Company, Akron 8, Ohio.*

Hycar

Reg. U. S. Pat. Off.

LARGEST PRIVATE PRODUCER OF BUTADIENE TYPE

Synthetic Rubber

Correct pronunciations and meanings of commonly used synthetic rubber names and terms are given in the new pocket-size Hycar Glossary. Write for free copy.

PHILBLACK A

Now just as easy to identify as it is to process

For your convenience, Philblack A is now packed in bags distinctively marked with broad crossed stripes of orange.

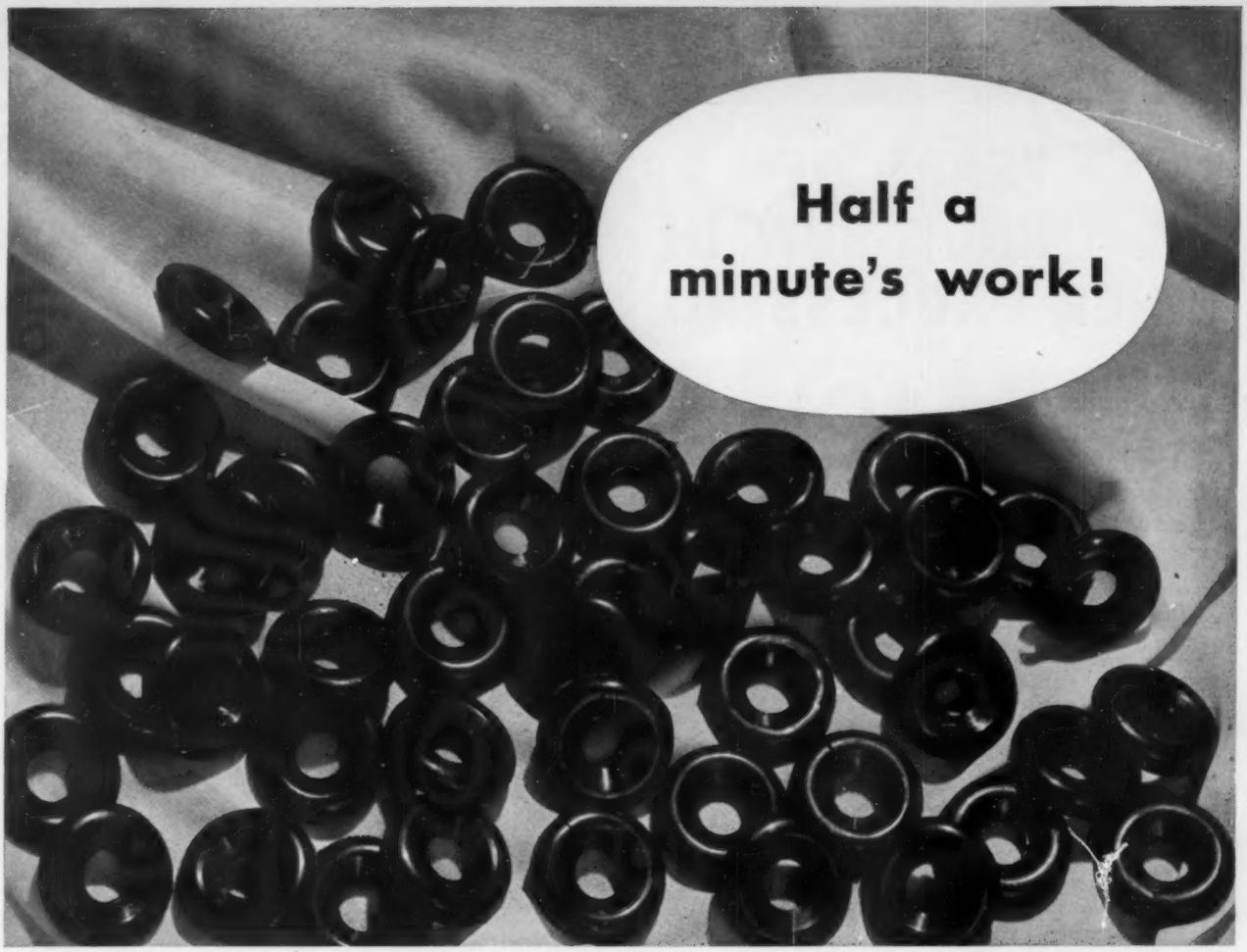
This clear and simple marking, giving immediate recognition, will aid you in the handling of your warehouse stock.

From now on, every time you see those broad orange stripes, you will know at once that the bag contains Philblack A, the new easy processing HMF type black which gives low heat build-up plus good abrasion.

The complete story of the properties and advantages of Philblack A is concisely and graphically presented in an illustrated booklet. Write for it . . . and for prices, availability and samples.

PHILLIPS PETROLEUM COMPANY
Philblack Division

FIRST CENTRAL TOWER • AKRON, OHIO



Geon grommets produced on 30-second cycle by injection molding

Those 48 GEON elastic grommets in the picture were produced in just *half a minute,* in an 8-ounce, 48-cavity injection molding machine. This high rate is typical of the many advantages offered by GEON, the *new* group of vinyl resins and plastics. But it is only *one* advantage.

From GEON may be made a wide variety of thermoplastics with many new characteristics in innumerable combinations. GEON may be compression or injection molded, extruded, cast into sheet or film—usually on standard machinery.

Here are some of the properties of GEON which may be had in a wide variety of combinations:

Flexible, waterproof, light weight, high tensile strength, easily embossed, wide range of colors and luster, and transparent, electrical insulation, odorless, wide hardness range.

Resistance to

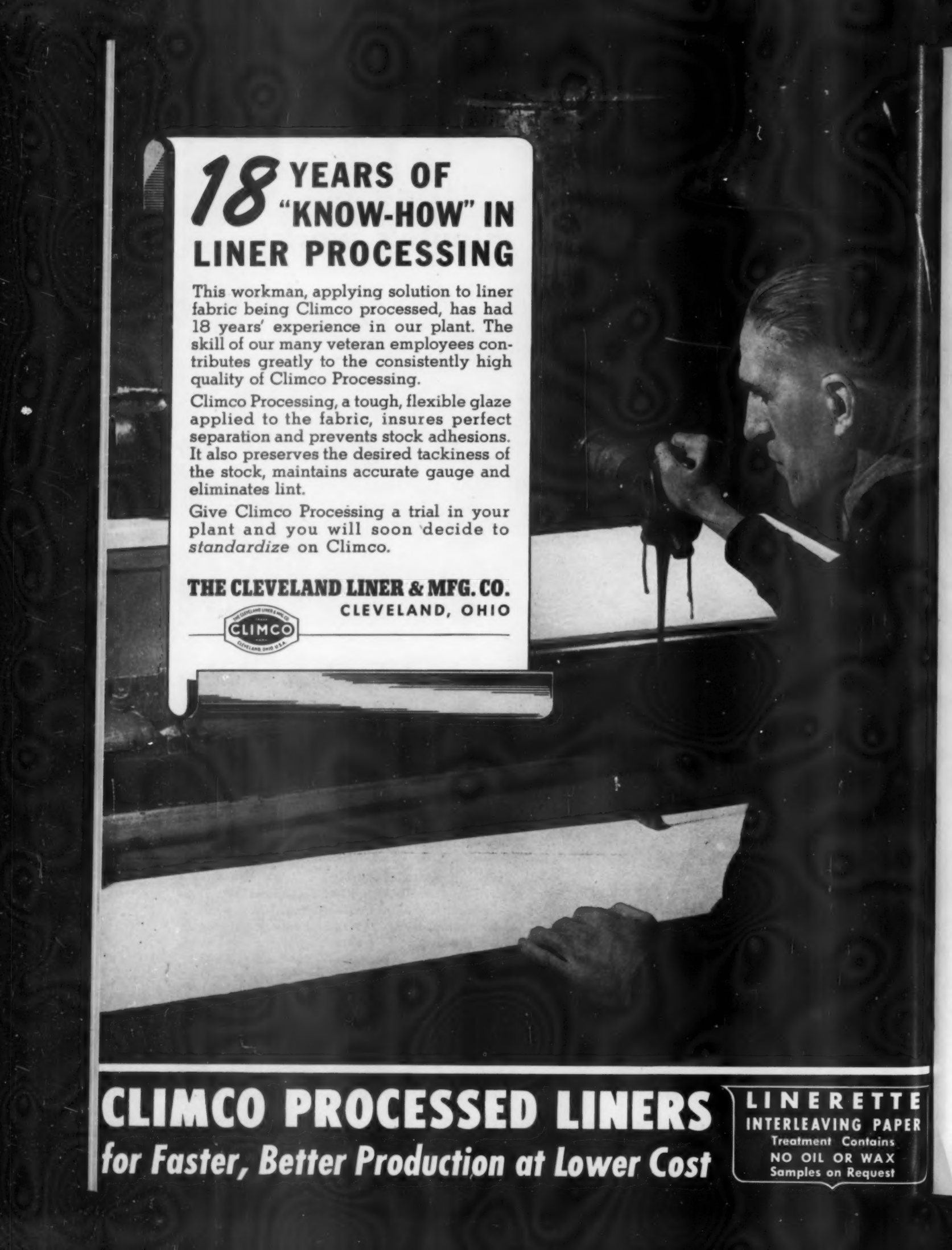
Acids	Chemicals	Air	Mildew	Abrasion
Alkalies	Foods	Aging	Cold	Sticking
	Light	Flame	Heat	

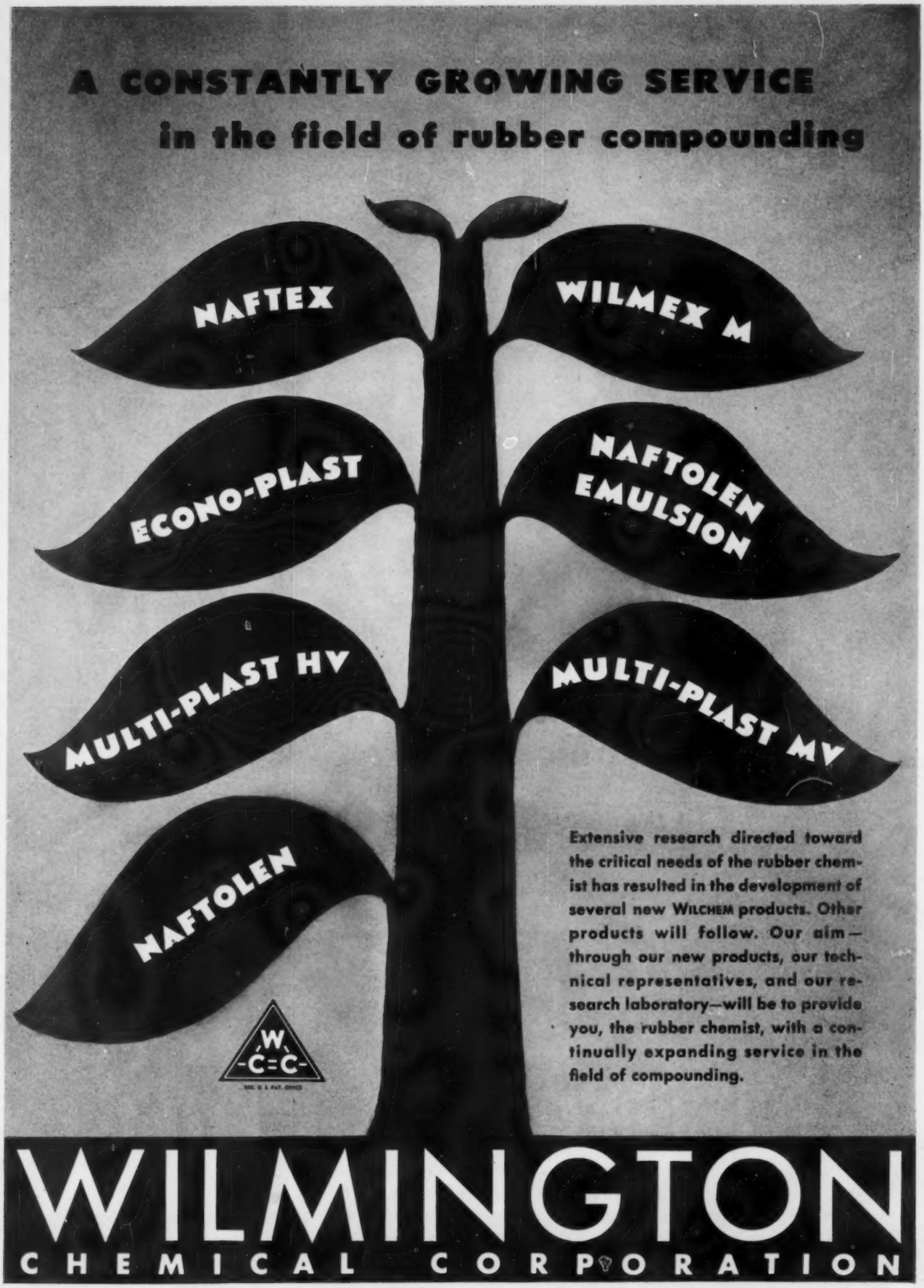
Properly blended with certain synthetic rubbers GEON products take on an entirely new set of characteristics.

Although GEON is currently available to industrial users, subject to allocation under General Preference Order M-10, limited quantities can be had for experiment. And our development staff and laboratory facilities are available to help you with specific problems or applications. Just write Department K-4, Chemical Division, The B. F. Goodrich Company, Rose Building, E. Ninth and Prospect, Cleveland 15, Ohio.

Geon
Vinyl Resins & Plastics

CHEMICAL DIVISION
THE B. F. GOODRICH COMPANY
ROSE BUILDING, E. NINTH & PROSPECT, CLEVELAND 15, OHIO


18 YEARS OF "KNOW-HOW" IN LINER PROCESSING
This workman, applying solution to liner fabric being Climco processed, has had 18 years' experience in our plant. The skill of our many veteran employees contributes greatly to the consistently high quality of Climco Processing.
Climco Processing, a tough, flexible glaze applied to the fabric, insures perfect separation and prevents stock adhesions. It also preserves the desired tackiness of the stock, maintains accurate gauge and eliminates lint.
Give Climco Processing a trial in your plant and you will soon decide to *standardize* on Climco.
THE CLEVELAND LINER & MFG. CO.
CLEVELAND, OHIO
CLIMCO
CLIMCO PROCESSED LINERS
for Faster, Better Production at Lower Cost
LINERETTE
INTERLEAVING PAPER
Treatment Contains
NO OIL OR WAX
Samples on Request


A CONSTANTLY GROWING SERVICE
in the field of rubber compounding
NAFTEX
WILMEX M
ECONO-PLAST
NAFTOLEN EMULSION
MULTI-PLAST HV
MULTI-PLAST MV
NAFTOLEN
Extensive research directed toward the critical needs of the rubber chemist has resulted in the development of several new WILCHEM products. Other products will follow. Our aim—through our new products, our technical representatives, and our research laboratory—will be to provide you, the rubber chemist, with a continually expanding service in the field of compounding.
WILMINGTON
CHEMICAL CORPORATION
10 EAST 40TH STREET • NEW YORK 16, N. Y.

DIELEX

(COMPOUNDED GILSONITE)

AND

DIELEX-ALBA

(SYNTHETIC WHITE WAX)

Two Organic Dielectrics for Use in Wire Insulation Compounds

EASY PROCESSING
LOW WATER ABSORPTION
HIGH MODULUS

LOW CAPACITANCE
LOW POWER FACTOR
HIGH RESISTIVITY

READILY AVAILABLE

HERRON BROS. & MEYER

82 Beaver Street, NEW YORK 5, N. Y.

516 Ohio Bldg., AKRON, OHIO

Sharples Announces
the VULTACS
A New Series of Vulcanizing Agents for GR-S and other Synthetic Rubbers

The VULTACS are a class of readily soluble organic sulfur compounds, which provide a new and effective means of achieving truly uniform vulcanization, resulting in:

- . . Unusual resistance to flex-cracking and tear.
- . . Outstanding retention of tensile strength and elongation upon aging.
- . . Lessening of "Marching Modulus" upon aging.

In addition, these new materials impart to uncured stocks:

- . . Easy processing characteristics.
- . . Improved pigment dispersion.
- . . Effective tack to GR-S formulations.

Three modifications of the VULTACS* based on *p-tert*-amylphenol are now available in commercial quantities:

	VULTAC #1	VULTAC #2	VULTAC #3
Derivative of *p-tert*-Amylphenol	Monosulfide[a]	Disulfide[b]	Disulfide[c]
Sulfur content	13%	23%	28%
Color and form	Soft Brown Resin	Hard Brown Resin	Hard Brown Resin
Softening point	45-55°C.	55-65°C.	70-80°C.
Specific Gravity 25/25°C.	1.11-1.12	1.16-1.17	1.19-1.20
Recommended Use	General Purpose Vulcanizing Tackifier	Primary Vulcanizing Agent for GR-S	Primary Vulcanizing Agent for Buna N polymers
Recommended Proportion	10-25 parts PHR with decreased sulfur	6-10 parts PHR	5-9 parts PHR

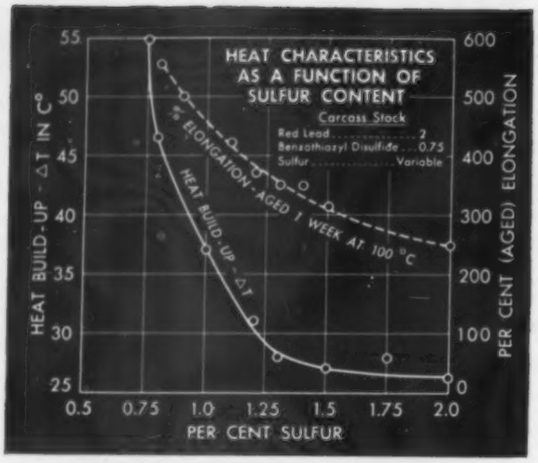
*Formerly offered as Sharples Vulcanizing Tackifiers:
[a] XP-35
[b] XP-164
[c] XP-171

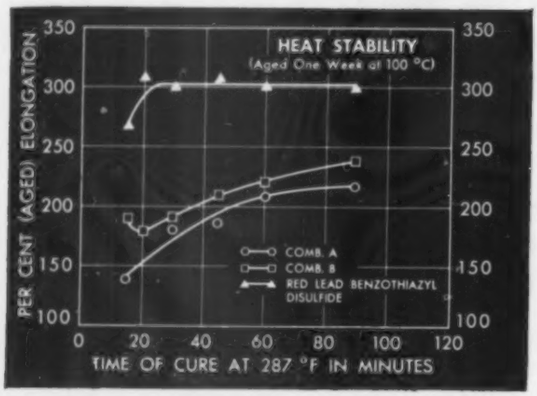
Literature and samples on request

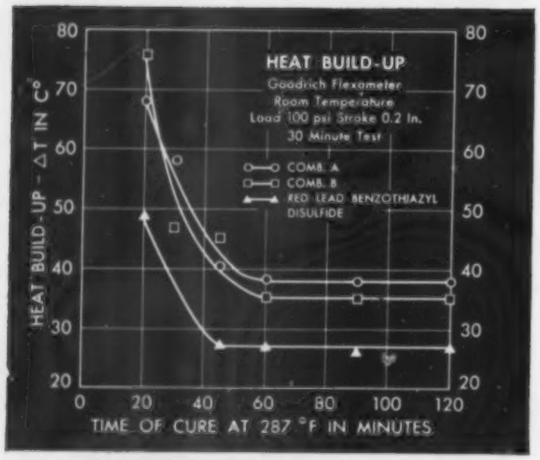
Please address all inquiries to Sharples Chemicals Inc., Development Department, 123 South Broad St., Philadelphia 9, Pa.

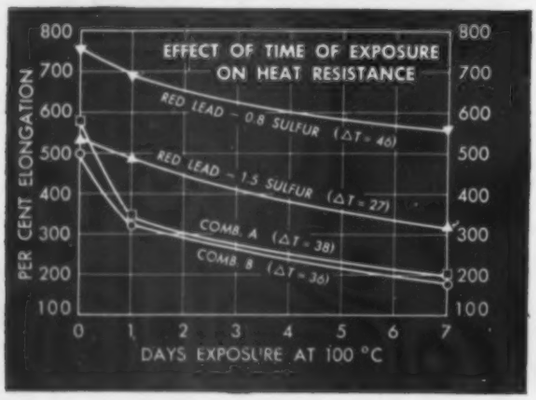
SHARPLES TRADE MARK CHEMICALS

SHARPLES CHEMICALS INC.
PHILADELPHIA CHICAGO NEW YORK


HEAT CHARACTERISTICS AS A FUNCTION OF SULFUR CONTENT
Carcass Stock
Red Lead 2
Benzothiazyl Disulfide 0.75
Sulfur ..... Variable
% ELONGATION - AGED 1 WEEK AT 100 °C
HEAT BUILD-UP - ΔT
HEAT BUILD-UP - ΔT IN C°
PER CENT (AGED) ELONGATION
PER CENT SULFUR


HEAT STABILITY
(Aged One Week at 100 °C)
COMB. A
COMB. B
RED LEAD BENZOTHIAZYL DISULFIDE
PER CENT (AGED) ELONGATION
TIME OF CURE AT 287 °F IN MINUTES




EFFECT OF TIME OF EXPOSURE ON HEAT RESISTANCE
RED LEAD - 0.8 SULFUR (ΔT = 46)
RED LEAD - 1.5 SULFUR (ΔT = 27)
COMB. A (ΔT = 38)
COMB. B (ΔT = 36)
PER CENT ELONGATION
DAYS EXPOSURE AT 100 °C

Heat build-up and heat stability . . . both improve when you compound GR-S with RED LEAD

Have you had difficulty making your GR-S carcass stocks both heat resistant and cool running?

If so, try the right combination of red lead, benzothiazyl disulfide and sulfur.

Its acceleration is sufficiently active and efficient to provide—concurrently—heat stability and low heat build-up.

Note the following table and the accompanying charts.

FORMULA

GR-S (Institute)	100
S.R.F. Black	30
Zinc Oxide	3.0
Paraflux	7.5
No. 2 R.M. Red Lead	2.0
Benzothiazyl Disulfide	0.75
Sulfur	1.5

Physical Properties

T/287° F.	*Tensile Strength*	*% Elong.*	*T-300*	*Shore*	*ΔT* in C°*
15	1520	860	315	....	....
20	1630	780	390	46	49
30	1450	630	520	47	47
45	1330	530	570	47	27.5
60	1210	480	520	47	27
90	1130	500	590	47	26
120	1100	500	610	47	28

	Aged One Week at 100° C.			***Aged 48 Hours at 100° C.***	
T/287° F.	*Tensile Strength*	*% Elong.*	*T-300*	*Shore*	*ΔT* in C°*
15	910	270	.....	....	....
20	1080	320	1000	54	30.5
30	990	300	990	54	30.5
45	1050	310	1000	53	29.5
60	1130	300	1090	53	26
90	1090	300	1090	53	25
120	1160	340	1100	53	25

** Goodrich Flexometer operated at room temperature. 30 minute tests. Load 100 psi, stroke 20%.*

SUMMARY OF ADVANTAGES

1. Imparts improved heat resistance—retention of elasticity.
2. Imparts improved heat build-up—cooler running.
3. Relatively faster curing rate.
4. Safe processing.
5. Excellent general physical properties.
6. Broad curing plateau—very little change in properties on overcures.
7. Economical.
8. Available.

The charts illustrated are taken from a report on recent experimental work by the Rubber Division of our Research Laboratories on the problem of heat build-up and heat stability in GR-S stocks. Write for your copy. The report is titled, "The Heat Problem in GR-S Carcass Stocks."

NATIONAL LEAD COMPANY New York, Buffalo, Chicago, Cincinnati, Cleveland, St. Louis, San Francisco; Boston (National-Boston Lead Co.); Pittsburgh (National Lead & Oil Co. of Penna.); Philadelphia (John T. Lewis & Bros. Co.).

UNITED ROLLS

Precision Built

FOR

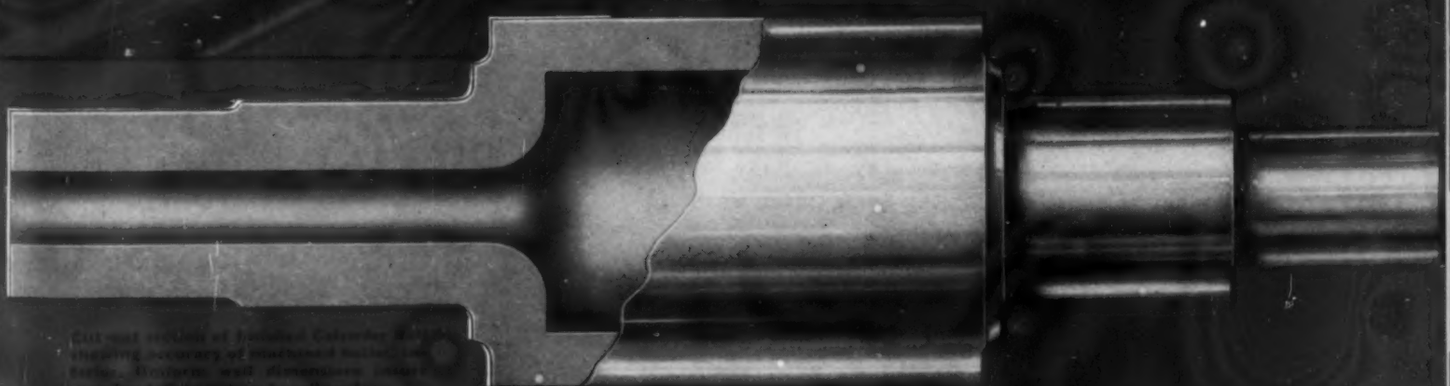
THE RUBBER INDUSTRY

Machining interior of UNITED Calender Roll.

ALL TYPES...ALL SIZES...
for WASHERS, CRACKERS, REFINERS, MILLS, CALENDERS.

There is a UNITED ROLL for every natural or synthetic rubber processing requirement. And because the perfection of UNITED ROLLS is the result of more than 30 years experience in roll design and manufacture for the rubber industry, you can be sure that their production is controlled by the most advanced technological processes. Hundreds of UNITED ROLLS are daily proving their superiority in outstanding rubber processing plants throughout the world.

When you are ready for roll renewals or specifications for new processing equipment, it will be to your advantage to consult with UNITED engineers.



Cut-away section of Finishing Calender Roll showing accuracy of machined surfaces and fillets. Rockers and dampeners under the roll bearings minimize vibration to roll face.

UNITED ENGINEERING and FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

Plants at PITTSBURGH, VANDERGRIFT, NEW CASTLE, YOUNGSTOWN, CANTON

Davy and United Engineering Company, Ltd., Sheffield, England

Dominion Engineering Works, Ltd., Montreal P. Q., Canada

The world's largest builders and users of Rolls and Rolling Mill Equipment

LOEWENTHAL
AND
RUBBER

Inseparable Since 1868

There is no substitute for experience plus ability. We have served the rubber reclaiming industry with expertly selected and assorted scrap rubber since its inception, and the experience thus gained, together with the extensive facilities developed over the years, is insuring today the best and most satisfactory service. Let us meet your scrap requirements properly and promptly.

THE LOEWENTHAL CO.

JACK SIDER, *President* J. K. McELLIGOTT, *Exec. Vice-Pres.*

We Solicit Your Inquiries

188 W. RANDOLPH STREET
CHICAGO 1, ILL.

159 CLEWELL STREET
AKRON 5, OHIO

Cable Address: "Gyblowell"

BAKER'S P-8

[Glyceryl Tri-aceto-ricinoleate]

a LOW-COST Plasticizer for Synthetic Elastomers

For Use In:

GRS
NEOPRENE GN
PERBUNAN
POLYVINYL CHLORIDE
COPOLYMERS OF POLYVINYL CHLORIDE
ETHYL CELLULOSE (ETHYL RUBBER)

As a plasticizer, Baker's P-8 contributes to:

1. Speed and ease of compounding.
2. A flexible stock with good physical characteristics.
3. Flexibility at low temperatures.
4. Retained Flexibility (P-8 exhibits extremely low volatility at elevated temperatures).

The plasticizing effect of P-8 for Perbunan
(40 parts of plasticizer)

Plasticizer	% Vol. 48 hrs. @ 150°C.	Flex. to °C.	Modulus @ 300%	Tensile psi	Elong. %	Set %	Shore Hard.
None	Nil	–30	2175	3225	395	15	75
P-8	1.6	–60	400	1650	665	20	45
Tricresyl Phosphate	9.5	–50	750	1475	515	25	60
Glycol Ester of Low Molecular Weight Fatty Acids	12.1	–60	550	1650	570	20	45

THE BAKER CASTOR OIL COMPANY

Established 1857

120 BROADWAY, NEW YORK 5, NEW YORK

Jersey City, New Jersey — Los Angeles, California — Bayonne, New Jersey

Good for Another 30,000 Miles?

SURE the tire is smooth. But if it hasn't been abused in service, it's good for 2 or 3 recap jobs. With reasonable care, by holding down driving speeds, by easy starting and stopping, and maintaining correct air pressures, it can deliver double the mileage for which it was originally intended.

You can thank America's skilled tire engineers for this doubling of tire life. For it is more than just a matter of recapping materials and application.

In your prewar tires, rubber company engineers, designed and built in *extra* quality and safety in sidewalls, the inner cords (carcass) and the bead. It is only because these constructions have generally stood up that it's possible for millions of motorists to continue driving with 4 and 5 year and even older tires.

Bead construction might have been made cheaper, but tire manufacturers purposely set high standards of workmanship and specified high quality steel wire for bead making.

And close collaboration between rubber engineers and National-Standard has resulted in reducing bead failures to a minimum.

Since the early days of the rubber industry, National-Standard has pioneered the development of better wire, improved wire construction and the design and building of wire applying machinery to improve and speed up production.

National-Standard's long experience naturally lead to the development of special wire for the improved service and longer life of many other rubber products, including many types of flexible hose, V-belts, conveyor belts, aircraft ignition cable shielding, and coverings for electrical cables.

National-Standard's engineering and research staffs are working on new uses and constructions of wire to improve scores of other products. Perhaps these developments can benefit your products—why not write and find out?

BACK THE ATTACK —BUY MORE WAR BONDS

NATIONAL STANDARD *Company*

Divisions of National-Standard Company

NATIONAL-STANDARD
Niles, Mich.
TIRE WIRE, FABRICATED BRAIDS AND TAPE

ATHENIA STEEL
Clifton, N. J.
COLD ROLLED, HIGH-CARBON SPRING STEEL

WAGNER LITHO MACHINERY
Hoboken, N. J.
LITHOGRAPHING AND SPECIAL MACHINERY

WORCESTER WIRE WORKS
Worcester, Mass.
ROUND STEEL WIRE, SMALL SIZES

There is an OROPLAST

For Every GR-S Processing Need

OROPLAST L for smooth tubing operations and for soft stocks of 40° hardness.

OROPLAST M for calendering, tubing and skim coating operations; for all molded goods.

OROPLAST H for carbon black master batches; for maximum plasticity of raw stock at processing temperatures; for tear resistance at elevated temperatures.

All grades of Oroplast produce highest elongation values without sacrificing tensile strength. Oroplasts are uniform chemical products designed and produced for the specific purpose of softening and extending GR-S rubber.

Write for our suggested formulations, using Oroplast in mechanical rubber goods from GR-S.

PRODUCT OF THE
ORONITE CHEMICAL COMPANY
OF SAN FRANCISCO, CALIF.

Sole Distributors

ADVANCE SOLVENTS & CHEMICAL CORPORATION

245 Fifth Avenue • New York, N. Y.

A Timely Reminder!

Pelletex and Gastex

The Leading Semi-Reinforcing Blacks (Furnace Type) for Natural and Synthetic Rubber Compounds

Easy Processing
Low Heat Build-up
Superior Aging
Low Permanent Set
High Resistance to Oil, Acids, Alkalis, Solvents and Strain

SUBSTANTIAL plant additions increasing the capacity of PELLETEX production by 20,000,000 pounds annually, will enable us to serve your post-war needs more promptly. Bear in mind that GASTEX and PELLETEX are produced in two States on different railroads, and served by separate gas fields.

HERRON BROS. & MEYER

OHIO BLDG., AKRON, OHIO.

GENERAL SALES AGENTS FOR

GASTEX TRADE MARK

PELLETEX TRADE MARK

GENERAL ATLAS CARBON

PAMPA, TEXAS—GUYMON, OKLA.

DISTRICT SALES AGENTS

ERNEST JACOBY & CO., Boston
HERRON BROS. & MEYER, New York
THE C. P. HALL CO. OF CALIF., Los Angeles
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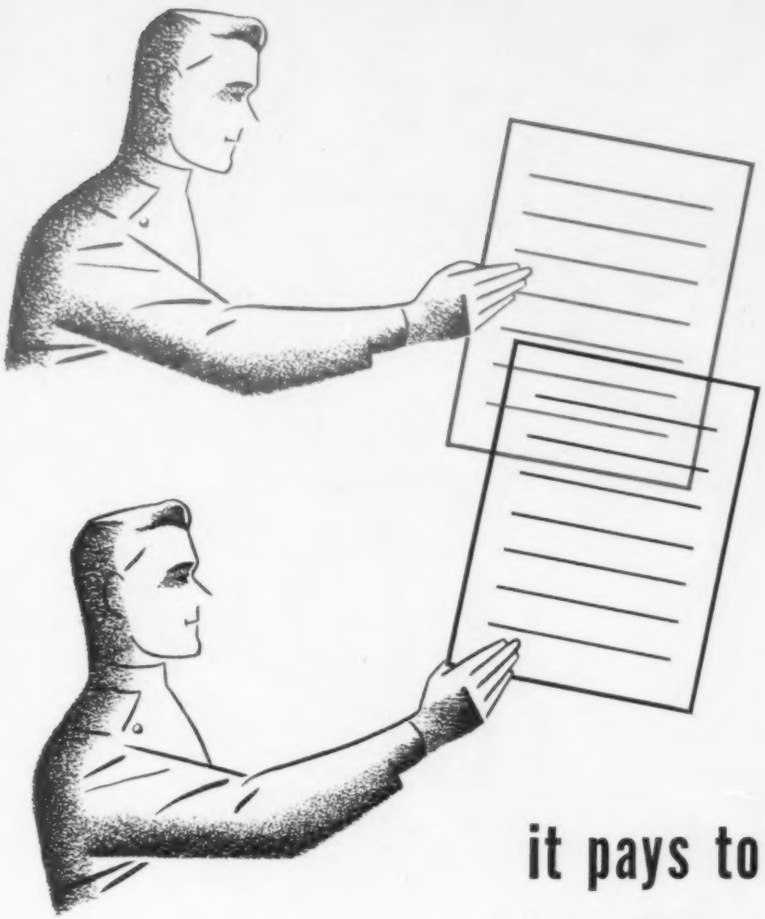
H. M. ROYAL, INC., Trenton, N. J.
ST. LAWRENCE CHEMICAL CO., LTD., Toronto - Montreal



it pays to COMPARE NOTES in rubber research

Notes on *your* research in rubber compounding plus data on *our* work in chemicals for rubber may equal the easy solution to many a tangled problem that may arise after the war.

After Victory, you can draw upon our vast reserve of wartime experience in chemistry, much of which directly applies to rubber compounding. If you have a problem in connection with your production of war essentials, we shall count it a privilege to compare notes now. MONSANTO CHEMICAL COMPANY, Rubber Service Department, Second National Building, Akron, Ohio. Telephone: HEmlock 6191.

MONSANTO CHEMICALS
SERVING THE RUBBER INDUSTRY

ACCELERATORS
ANTIOXIDANTS
COLORS
PLASTICIZERS
INSOLUBLE SULFUR "60"
WETTING AGENTS

MONSANTO CHEMICALS
SERVING INDUSTRY...WHICH SERVES MANKIND

TROUBLE? Gobs of It!

Yes—and there's trouble and plenty of it in your plant when the solvents you are using vary in uniformity from one shipment to another. For if there's one thing you've got to have in a solvent, it is *uniformity.*

Lack of uniformity, however, is one headache you can easily avoid. How? With SKELLYSOLVE. Uniformity in SKELLYSOLVE is assured by the Skelly method of refining it. Scientific, instrumented control of the process eliminates human error.

There is a type of SKELLYSOLVE that will meet your specific requirements. Shipment of that type you receive next week, or next summer, or next year, will have the characteristics identical with those of the SKELLYSOLVE you get today.

SKELLYSOLVE
in the
RUBBER INDUSTRY

There are six different types of Skellysolve which are especially adapted to various uses in the rubber industry, for making rubber cements, and for many different rubber fabricating operations. Skellysolve offers many advantages over benzol, rubber solvent gasoline, toluol, carbon tetrachloride, etc. It will pay you to investigate Skellysolve. Write today.

SKELLY OIL COMPANY
SKELLY
SILVER JUBILEE
25 YEARS OF PETROLEUM PROGRESS

SKELLYSOLVE

SOLVENTS DIVISION, SKELLY OIL CO.
SKELLY BLDG., KANSAS CITY, MO.

NET WEIGHT 50 LBS.
KOSMOS 40
KOSMOS 40
UNITED CARBON COMPANY, INC.
KOSMOS 40
U.S.A.
KOSMOS 40
KOSMOS 40
MADE IN U.S.A.

KOSMOS 40

This latest furnace-process reinforcing carbon black (HMF type) for synthetic and natural rubber possesses a combination of most desirable characteristics—

- cool mixing
- easy processing
- smooth and rapid extrusion
- fast rate of cure
- full reinforcement
- low heat build-up
- high resiliency
- high resistance to cut growth, flex cracking and abrasion.

Kosmos 40 is especially useful for tires of all types, pneumatic or solids, under any conditions; tubes, bogie wheels; footwear; and mechanical goods.

Try a 50-50 blend of Kosmos 40 and channel black for tread stock to secure better plasticity. It will make it possible for you to dispense with one milling and thus—which is so important now—INCREASE YOUR OUTPUT.

RESEARCH DIVISION

UNITED CARBON COMPANY, INC.

Charleston, West Virginia

THIS F/B SOUND FILM

tells the story of Pellet Rubber

A

The picture contrasts old methods, still employed, of piling, trucking and storing rubber in bulky slabs or sheets with . . .

B

. . . the simplified handling of free-flowing pellets that can be transported on continuously moving conveyors and stored in space-saving overhead bins.

C

Pellets are shown as they are extruded from a Gordon plasticator-pelletizer, dusted with soapstone to prevent sticking together, and . . .

D

. . . cooled by a series of water sprays. It is estimated that the time for cooling is less than ten minutes or one-fourth the time necessary to cool sheets or slabs.

E

400 pounds of rubber in pellet form are accurately weighed in a fraction of the time required when slabs or sheets are cut into small pieces by hand. A master batch — 400 pounds of rubber and an equal quantity of carbon black, also in pellet form — is made in less than four minutes.

F

This one-reel film clearly demonstrates the many advantages resulting from pellet rubber. Simplified processing and storage, reduced production costs, improved uniformity and quality of finished product, all follow the mechanization of handling and weighing procedures.

FARREL-BIRMINGHAM COMPANY, INC., Ansonia, Conn.
Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Pittsburgh, Akron, Los Angeles

HOW YOU CAN SEE THE PICTURE "PELLET RUBBER"

This 16 mm film is available to those interested in borrowing it. Reservations will be made in the order in which they are received. It is suggested that alternate choice of dates be given in requests. There are no charges other than the cost of transportation and insurance of the film.

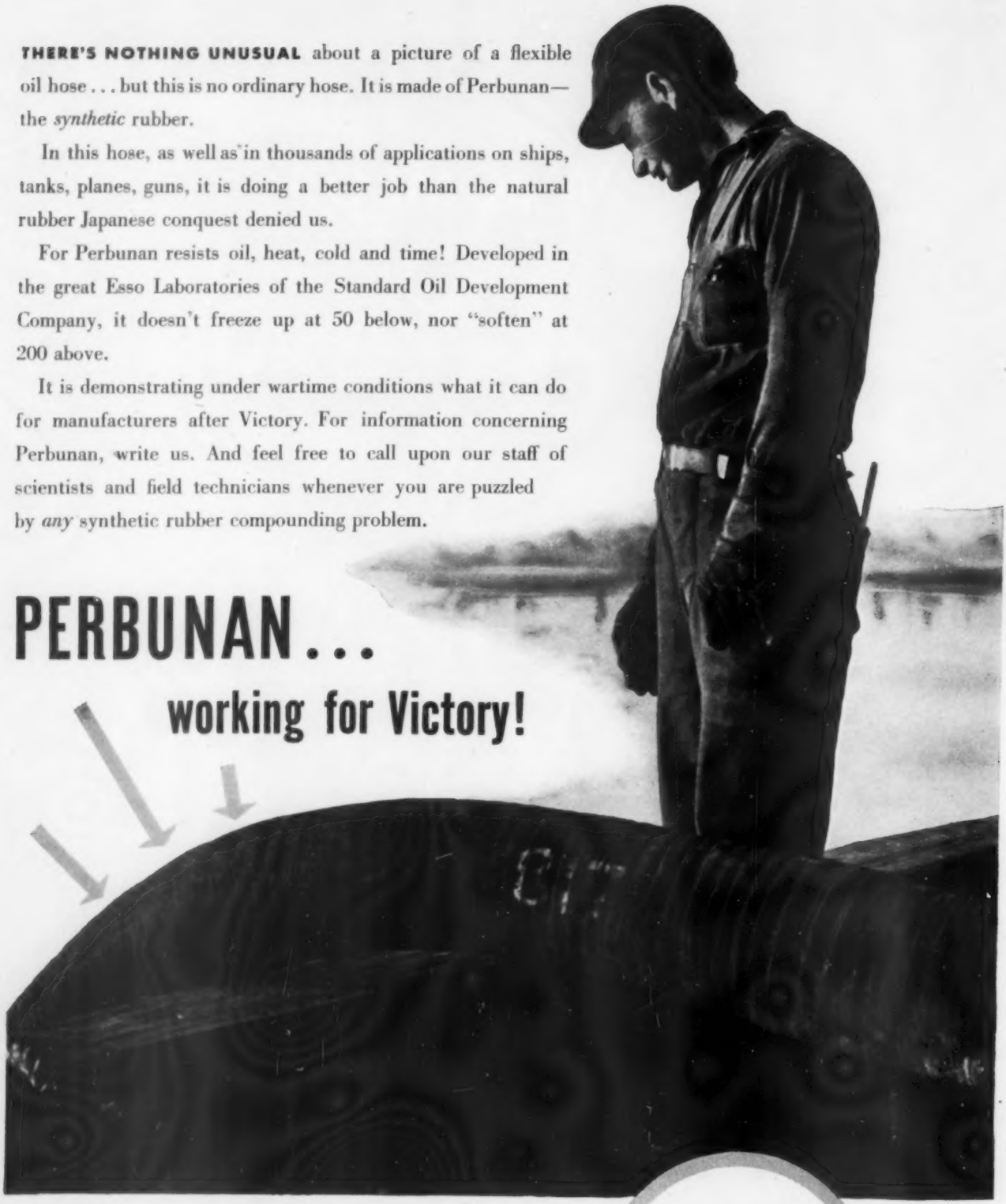
Farrel-Birmingham

THERE'S NOTHING UNUSUAL about a picture of a flexible oil hose . . . but this is no ordinary hose. It is made of Perbunan—the *synthetic* rubber.

In this hose, as well as in thousands of applications on ships, tanks, planes, guns, it is doing a better job than the natural rubber Japanese conquest denied us.

For Perbunan resists oil, heat, cold and time! Developed in the great Esso Laboratories of the Standard Oil Development Company, it doesn't freeze up at 50 below, nor "soften" at 200 above.

It is demonstrating under wartime conditions what it can do for manufacturers after Victory. For information concerning Perbunan, write us. And feel free to call upon our staff of scientists and field technicians whenever you are puzzled by *any* synthetic rubber compounding problem.



PERBUNAN...

working for Victory!

THE SYNTHETIC RUBBER THAT RESISTS OIL, COLD, HEAT AND TIME

PERBUNAN
REG. U. S. PAT. OFF.

Write STANCO DISTRIBUTORS, INC., 26 Broadway, New York 4, N.Y.
Warehouse stocks in New Jersey, California and Louisiana

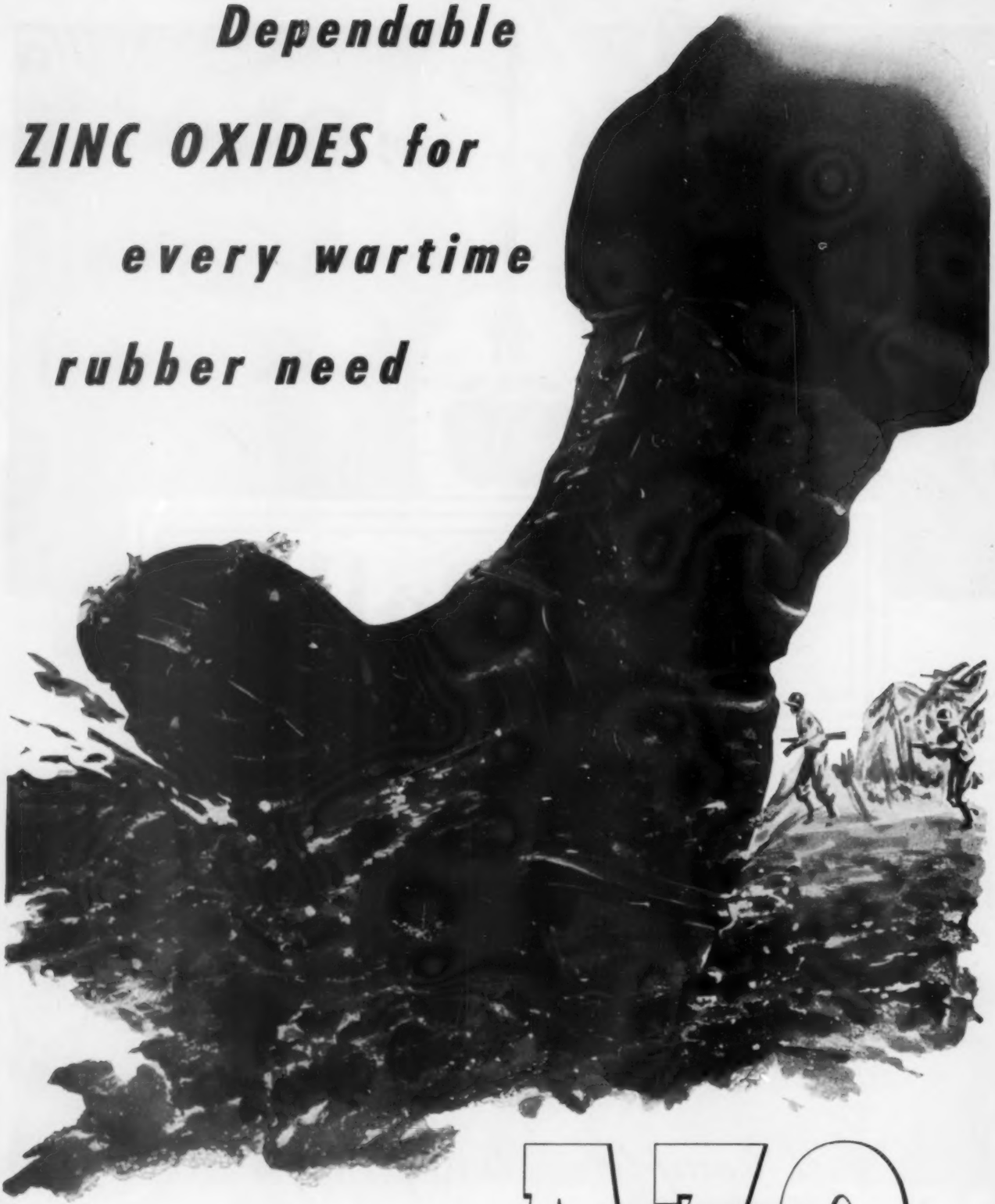
The C. P. Hall Co.
CHEMICAL MANUFACTURERS

ACCELERATORS
PLASTICIZERS
ANTIOXIDANTS

A Complete Line of Approved Compounding Materials

AKRON, OHIO • LOS ANGELES, CALIF. • CHICAGO, ILL.

Dependable ZINC OXIDES for every wartime rubber need



AZO

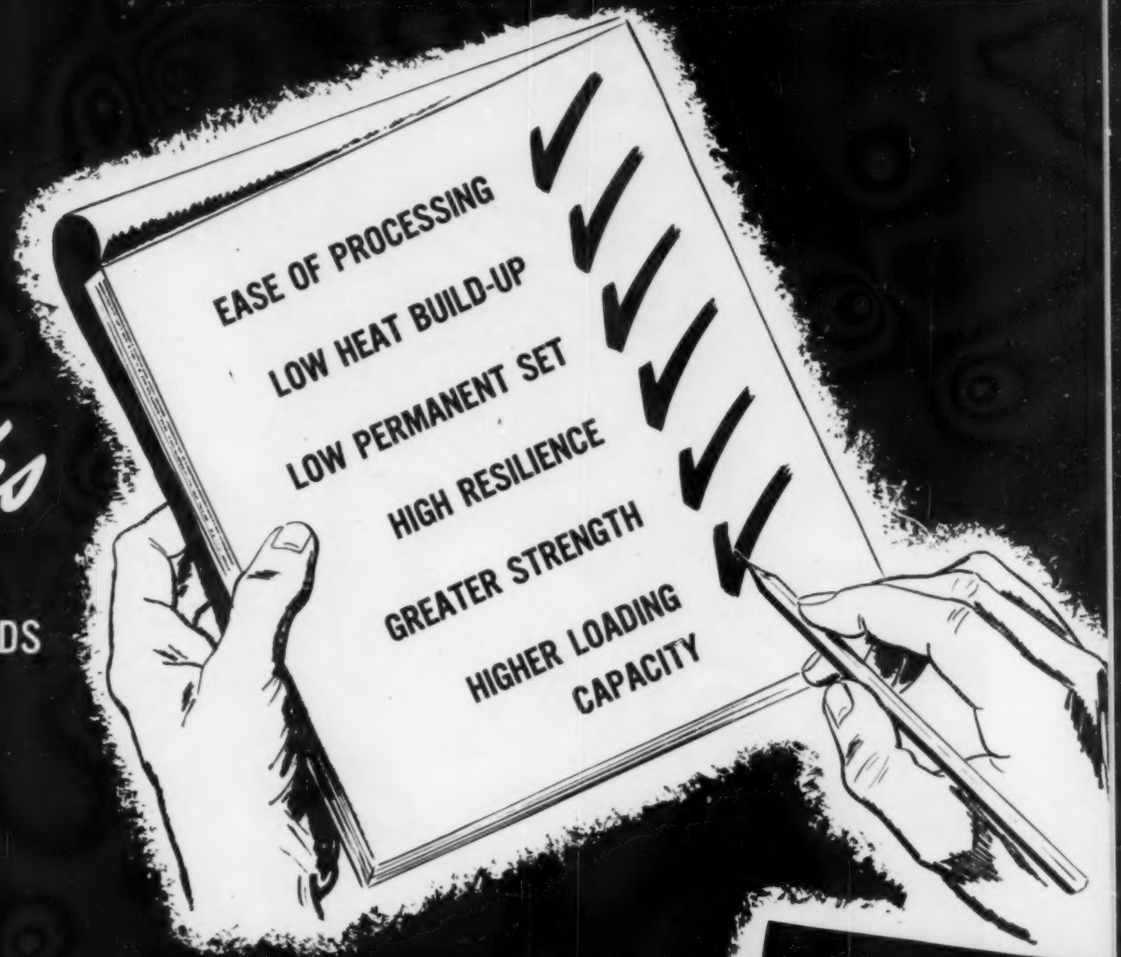
ZINC OXIDES

AMERICAN ZINC SALES CO., Distributors for AMERICAN ZINC, LEAD & SMELTING CO.

COLUMBUS, OHIO - CHICAGO - ST. LOUIS - NEW YORK

Continex SRF

SEMI-REINFORCING FURNACE BLACK



Checks

WITH VITAL PROCESSING NEEDS

NOW in full scale production at Continental's new plant, Continex SRF is a perfected semi-reinforcing furnace type black that is "engineered" to provide improved processing results.

SEND FOR YOUR COPY of the Continex SRF Technical Bulletin. Prepared by the Witco Research Laboratories, it gives a detailed report on the properties and characteristics of Continex SRF.

CONTINENTAL CARBON COMPANY
MANUFACTURER
[CONTINENTAL CHANNEL AND FURNACE BLACKS]

WITCO CHEMICAL COMPANY
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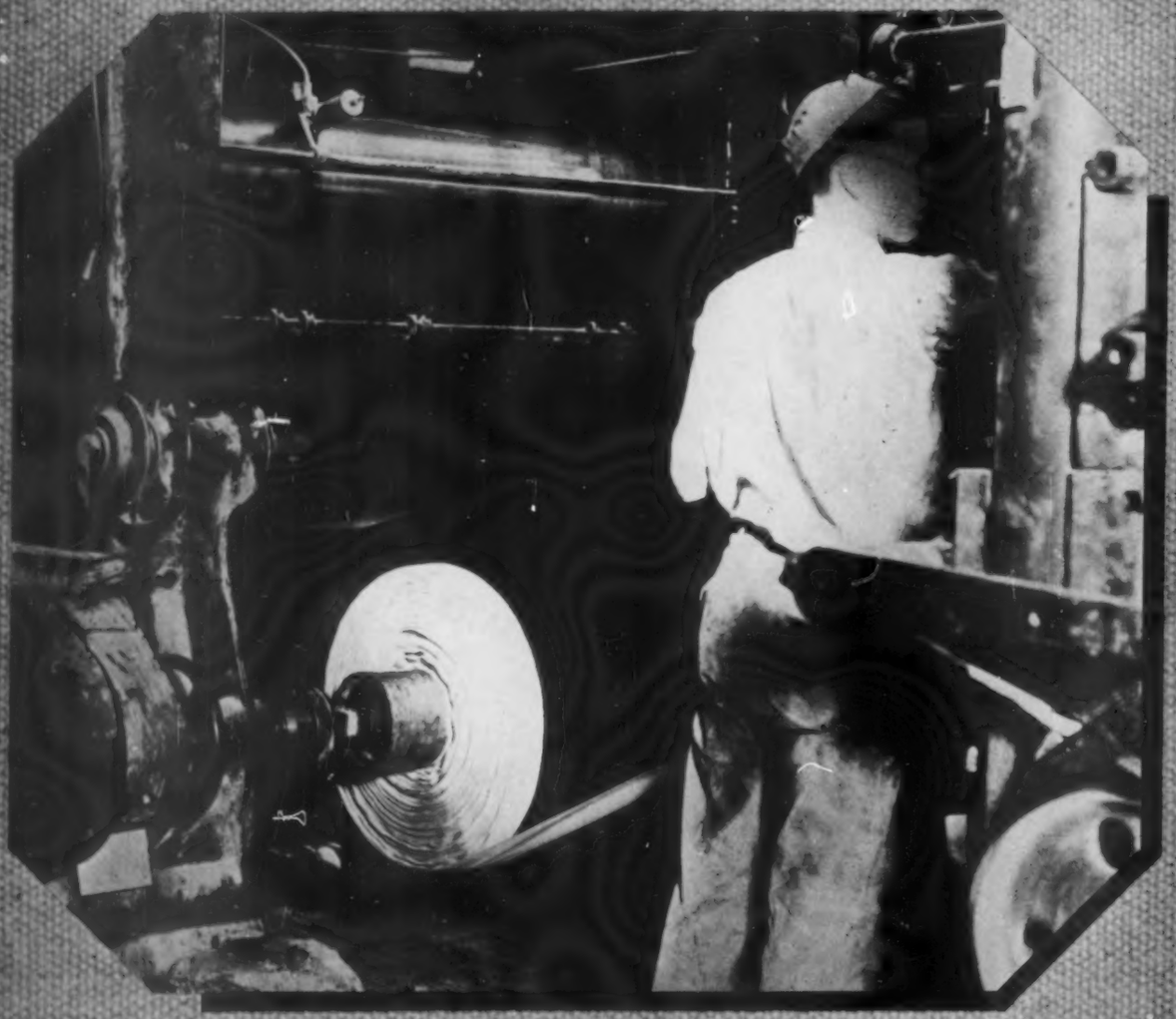
ASSOCIATED WITH UNIFORM QUALITY FOR OVER HALF A CENTURY

MT. VERNON FABRICS



. . . The Wind Up of Quality

Perhaps you have never quite looked at it this way before, but the mill which supplies you with industrial fabrics, is, as a matter of fact, but a projection of your own plant. It is there that the first step toward the successful completion of your own products begins. That is the reason for the broad system of laboratory control which guides every step of the production of MT. VERNON fabrics.

MT. VERNON WOODBERRY MILLS, INC.

TURNER HALSEY COMPANY

Selling Agents

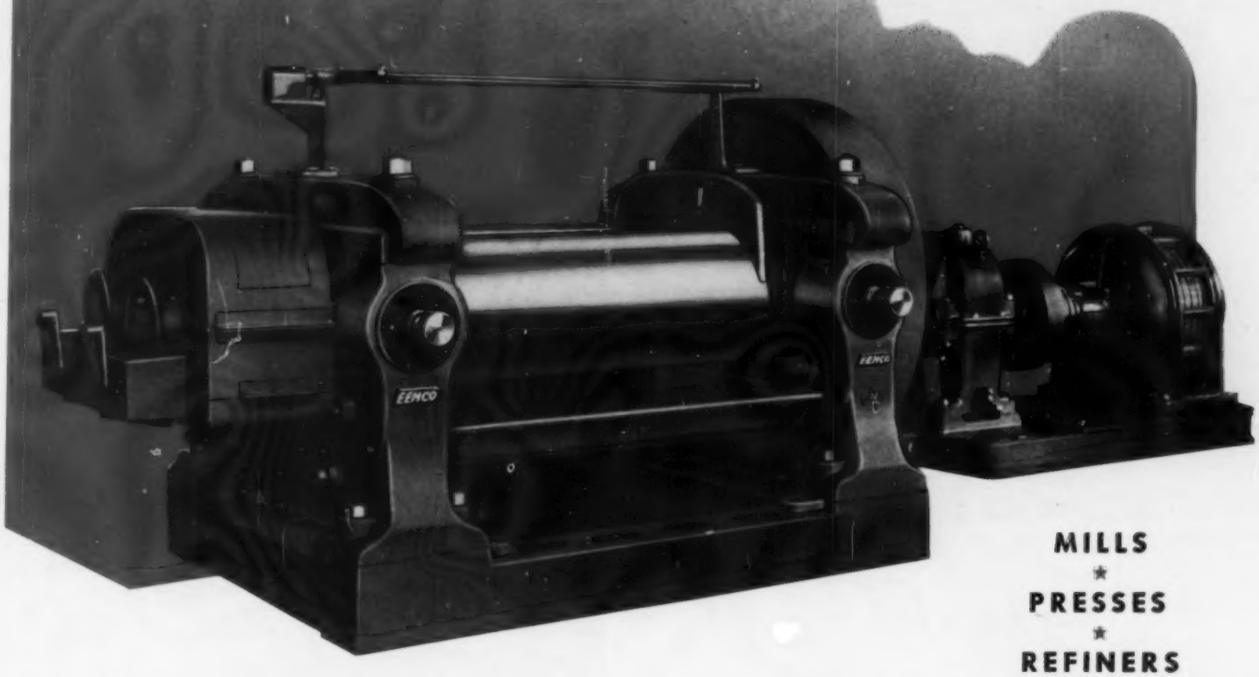
40 WORTH STREET ★ NEW YORK, N. Y.

CHICAGO · NEW ORLEANS · ATLANTA · BALTIMORE · BOSTON · LOS ANGELES · SAN FRANCISCO

Mills *for mixing and compounding*

ALL KINDS OF

RUBBER *and* PLASTICS



MILLS
★
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EEMCO has the facilities to assure exceptionally early deliveries of Rubber and Plastics Processing Machinery. Whatever your needs may be it will pay you to call on EEMCO for your requirements.

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EEMCO — *Erie Engine & Mfg. Co.*

SUCCESSOR TO "NAGLE"

953 EAST 12th ST., ERIE, PENNA.

Continuous Supplies...

CALL FOR MOUNTING DOLLARS

Official U. S. Coast Guard photo

Official U. S. Marine Corps photo

....STEP UP YOUR PAY ROLL PLAN!

War is a continuous job.

Ever-widening, ever-advancing fighting fronts call for a never-ending flow of manpower and materiel—*financed by a continuous flow of money.*

Your responsibility as top management increases with the mounting tide of battle. You've been entrusted with two major responsibilities—steadily maintained production, and steadily maintained War Bond Sales through your Pay Roll Savings Plan.

So keep this one salient fact before you at all times: *The backbone of our vital war financing operation is your Pay Roll Savings Plan.*

Your job is to keep it constantly revitalized. See to it that not a single new or old employee is left unchecked. See to it that your Team Captains solicit everyone for regular week-in and week-out subscriptions. And raise all percentage figures wherever possible.

Don't underestimate the importance of this task. This marginal group represents a potential total sales increase of 25% to 30% on all Pay Roll Plans.

Constant vigilance, in a quiet way, is necessary to keep your Pay Roll Savings at an all-time high. Don't ease up—*until the War is won!*

The Treasury Department acknowledges with appreciation the publication of this message by:

Back the Attack!

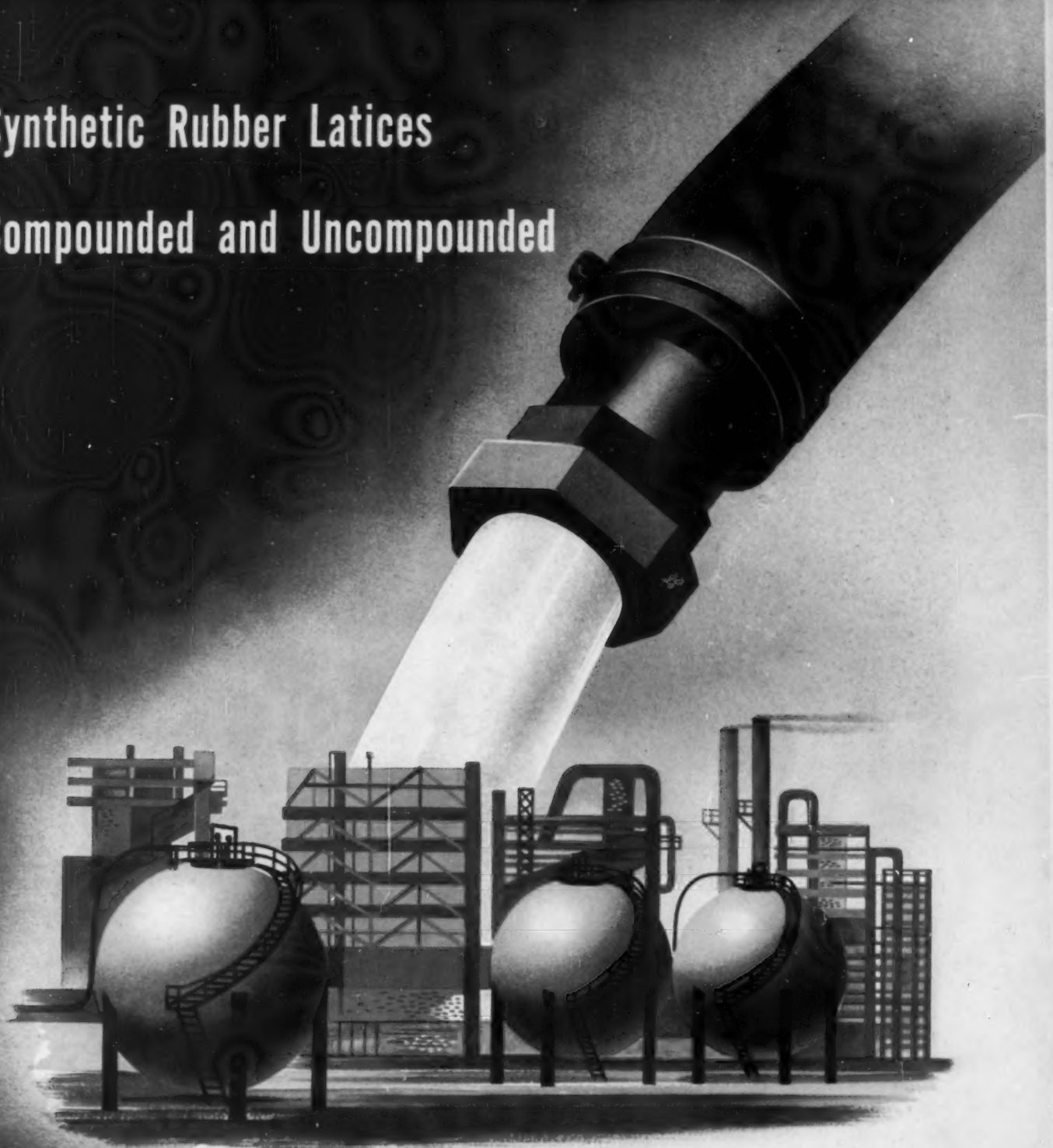
SELL MORE THAN BEFORE!

THE RUBBER AGE

This is an official U. S. Treasury advertisement prepared under the auspices of Treasury Department and War Advertising Council

Synthetic Rubber Latices

Compounded and Uncompounded



Naugatuck Chemical

DIVISION OF UNITED STATES RUBBER COMPANY

1230 SIXTH AVENUE, NEW YORK 20, N. Y.

In Canada: DOMINION RUBBER COMPANY, LTD., MONTREAL

IMPORTANT FIRST STEPS

To Great Developments!

BEFORE full strides in production are possible, every product must pass through the first painstaking steps of laboratory research and pilot plant testing. Success at these critical stages of development depends much upon fine or "special" chemicals of unvarying quality and purity. While only small amounts may be required at first, *large quantities* are often necessary for full scale manufacture.

The furnishing of such fine and "special" chemicals for industry is a familiar and widely-known service of the Baker & Adamson Division of the General Chemical Company.

. . . Baker & Adamson has long been recognized for the exceptionally high standards of purity maintained in the manufacture of its laboratory reagents and fine chemicals. Today new and expanded facilities *increase still further its capacity for producing such chemicals in industrial quantities!*

Why not plan now with Baker & Adamson and be sure of having the fine or "special" chemicals for every step of your product development when you need them?

GENERAL CHEMICAL COMPANY

Fine Chemicals for Industrial America

GENERAL CHEMICAL COMPANY
40 RECTOR STREET, NEW YORK 6, N. Y.

Technical Service Offices: Atlanta · Baltimore · Boston · Bridgeport (Conn.) Buffalo · Charlotte (N. C.) · Chicago · Cleveland · Denver · Detroit · Houston Kansas City · Milwaukee · Minneapolis · New York · Philadelphia · Pittsburgh Providence (R. I.) · St. Louis · Utica (N. Y.)

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OR-

THIS?

This Seals the Air!

All Standard Schrader Valve Caps contain this specially designed sealing unit with a dome-shaped rubber washer vulcanized between two dome-shaped BRASS plates. Because of their unique construction, these caps are guaranteed airtight up to 250 lbs. pressure. This mighty midget does the work.

MR. & MRS. AMERICA

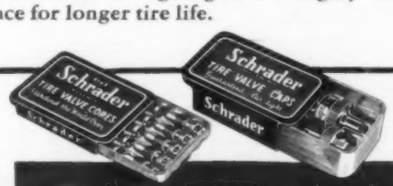
Today your tires may seem good for many more miles—but don't let underinflation ruin them; check them now. Inflate if necessary. And be sure a Schrader Valve Cap is on every tire including the spare—screwed down fingertight. It's mighty cheap insurance for longer tire life.

YOU wouldn't use a camel if your tires gave out? Maybe not—but you'll wish you had one if you cannot get the new tires you need. It will be some time before there will be enough tires to supply everyone. So save your present ones by keeping them properly inflated.

What's so important about correct inflation? Just this. A popular sized tire *underinflated only 6 pounds,* loses 30% of its potential mileage.

Protection against underinflation is easy. Check pressure regularly. Put air in tires when needed, and seal that air in. That's important. SEAL that air in. The Schrader Valve Cap does it. Applied firmly, these caps provide an airtight seal up to 250 pounds pressure—more than you'll ever need. So when you inflate tires, be sure a Schrader Cap is on every valve, including the spare.

Schrader Caps are available in the familiar red, white and blue package wherever gas or tires are sold—or tires are serviced.



Schrader
REG. U.S. PAT. OFF.
CONTROLS THE AIR

NEXT TIME YOU GET GAS

Get Air—Get AIRTIGHT CAPS

SOLD EVERYWHERE

A. SCHRADER'S SON, ***Division of Scovill Manufacturing Company, Incorporated,*** **BROOKLYN, NEW YORK**

Unfinished Business!

• Behind the door of America's chemical industry is being conducted one of science's most important pieces of unfinished business—the exploration of coal-tar.

Already this war has given impetus to a host of amazing new coal-tar developments.

Niacin, in the Vitamin B Complex . . . many of the new life-saving sulfa drugs . . . scores of compounding materials, helping to make possible our vitally essential synthetic rubber industry . . . DDT . . . and finally, one of the most notable of modern chemical syntheses—the exact duplication of the complex quinine molecule.

For the even more memorable advances to be anticipated in the future, Barrett stands ever available as a key source of supply for coal-tar chemicals. If you are working on any problems involving coal-tar, or any of its derivatives, Barrett invites your inquiries.

THE BARRETT DIVISION
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40 RECTOR STREET, NEW YORK 6, N. Y.

BARRETT COAL-TAR CHEMICALS: Tar acids: Phenols, Cresols, Cresylic Acids, Naphthalene • Phthalic Anhydride • Dibutyl Phthalate • Pyridine Cumar* (Paracoumarone-indene Resin) • Rubber Compounding Materials • Bardol* • Barretan* • Pickling Inhibitors • Benzol • Toluol • Xylol • Solvent Naphtha, Hi-Flash Solvent • Hydrogenated Coal-Tar Chemicals • Flotation Agents • Tar Distillates • Anhydrous Ammonia • Ammonia Liquor • Ammonia Nitrate • Sulphate of Ammonia • Arcadian*, the American Nitrate of Soda.

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Barrett

ONE OF AMERICA'S GREAT BASIC BUSINESSES

a step in the right direction for product-improvement

SILENE EF

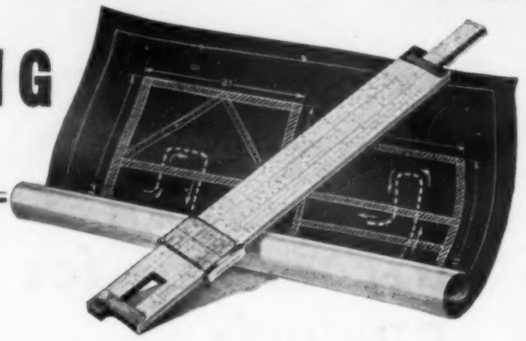
SILENE EF, a precipitated, white reinforcing pigment is giving outstanding improvements to GR-S compositions in a wide range of rubber products. . .

- **In Inner Tubes. . .**
  By improving the retention of elongation and minimizing box cracking, thus producing a tube of better service qualities.
- **In Soles and Heels. . .**
  To end the tendency of such products to mark floors and to give better abrasion-resistance, thus improving quality and service.
- **In Rubber Sundries. . .**
  By giving better physical properties to finished products. By improvement of hot tear, resulting in ease of stripping from molds and mandrels, thus reducing scrap and seconds.
- **SILENE EF is also being used with outstanding results in a wide variety of other rubber products.**

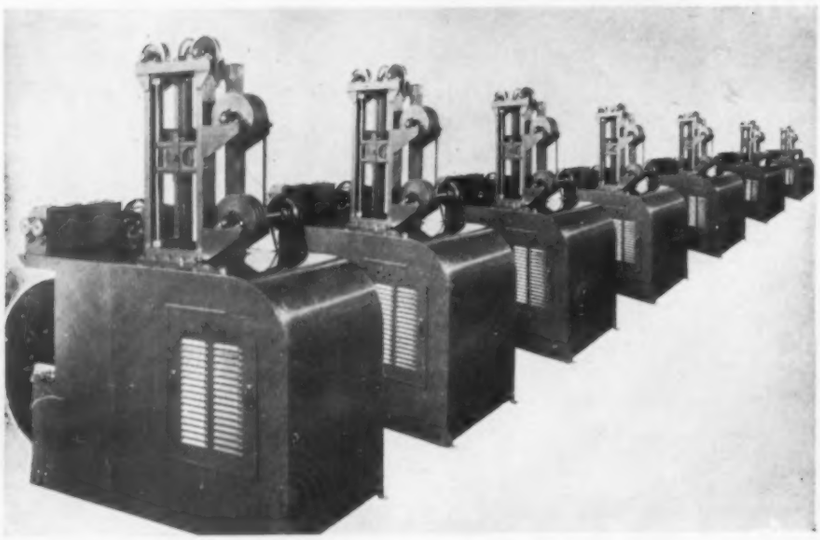
SILENE EF is readily available in large quantities. Our Technical Staff will assist in its application to your products. Write for data and samples.

STANDARD *Chemical Company*
General Offices: AKRON 8, OHIO

OVEN ENGINEERING NEWS



IOE Windup Machine Now Made In Quantity Lots for Rubber, Wire, Textiles and Synthetics



Originally developed as special equipment to speed the production of more uniform cable insulation finishes, the **IOE** constant-speed constant-tension windup machine has since provided a solution for many other manufacturing and processing problems.

Used in conjunction with a cable lacquering system, it acts as the power unit which draws the cable from an unwind unit through lacquer pots and drying tower at uniform speed and tension, and this function has been extended to the rubber industry where the windup machine serves as the power unit for continuous curing systems, handling tubing, hose, coated fabrics and other continuous materials.

Equipped with a spool and rolls (instead of a reel and sheaves), it is used for the final windup of textiles after processing, and in the synthetic industry it is similarly used to wind processed materials such as shower curtains and tire fabrics.

Built in Quantity

These machines are still made to individual order, but all parts are standardized, and the units are being built in quantity. Two standard sizes are now available. These are:

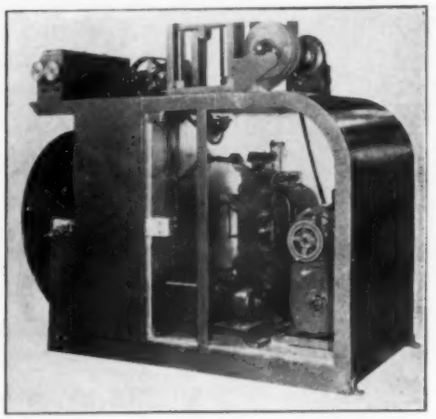
No. 1—26″—36″ reel diameter
No. 2—12″—24″ reel diameter

The **IOE** windup machine is a complete, self contained unit with combination variable speed and hydraulic synchronizing equipment, designed to provide constant speed and constant tension within a variable production range. By arrangement of adjustable tension devices, tension on the material can be varied from a few ounces to hundreds of pounds. The machine is motor driven, requires no outside source of power or synchronization, and can be used in conjunction with either driven or friction unwind machinery. It is supplied in higher speeds for extrusion windup of rubber and synthetic insulation materials.

Shown in the right column is a close-up of the interior of the **IOE** windup machine. Note the hydraulic pump and motor, speed adjusting handwheel, hydraulic speed changer, and main variable speed capstan drive. All are readily accessible and easy to operate.

Variety of Equipment

The Industrial Oven Engineering Company designs and manufacturers heating and processing ovens of every variety for temperatures ranging up to 1000° F., as well as materials handling equipment to be used in conjunction with ovens. The **IOE** windup machine, for example, may be supplied as part of an **IOE** cable lacquering and baking system or for independent use. Among other regular installations are:



1. Synthetic tire fabric dipping and drying equipment.
2. Synthetic tire fabric post-calender dipping systems.
3. Coated fabric impregnation systems.
4. Rubber curing ovens.

Get More Data

"Blueprint for Industry — Part III" is a four-page engineering folder describing the **IOE** windup machine in detail. A copy will be sent you upon request.

(This is No. 13 of a series. Reprints of previous advertisements will be sent free upon request.)

ENGINEERING VERSATILITY

THE INDUSTRIAL *Oven Engineering* COMPANY

11621 DETROIT AVE., CLEVELAND 2, OHIO

Engineering Representatives in Principal Industrial Areas

★ ASSOCIATED COMPANY: JAMES DAY MACHINERY LTD., LONDON, W. 1, ENGLAND ★

---he's a "key" man in transportation

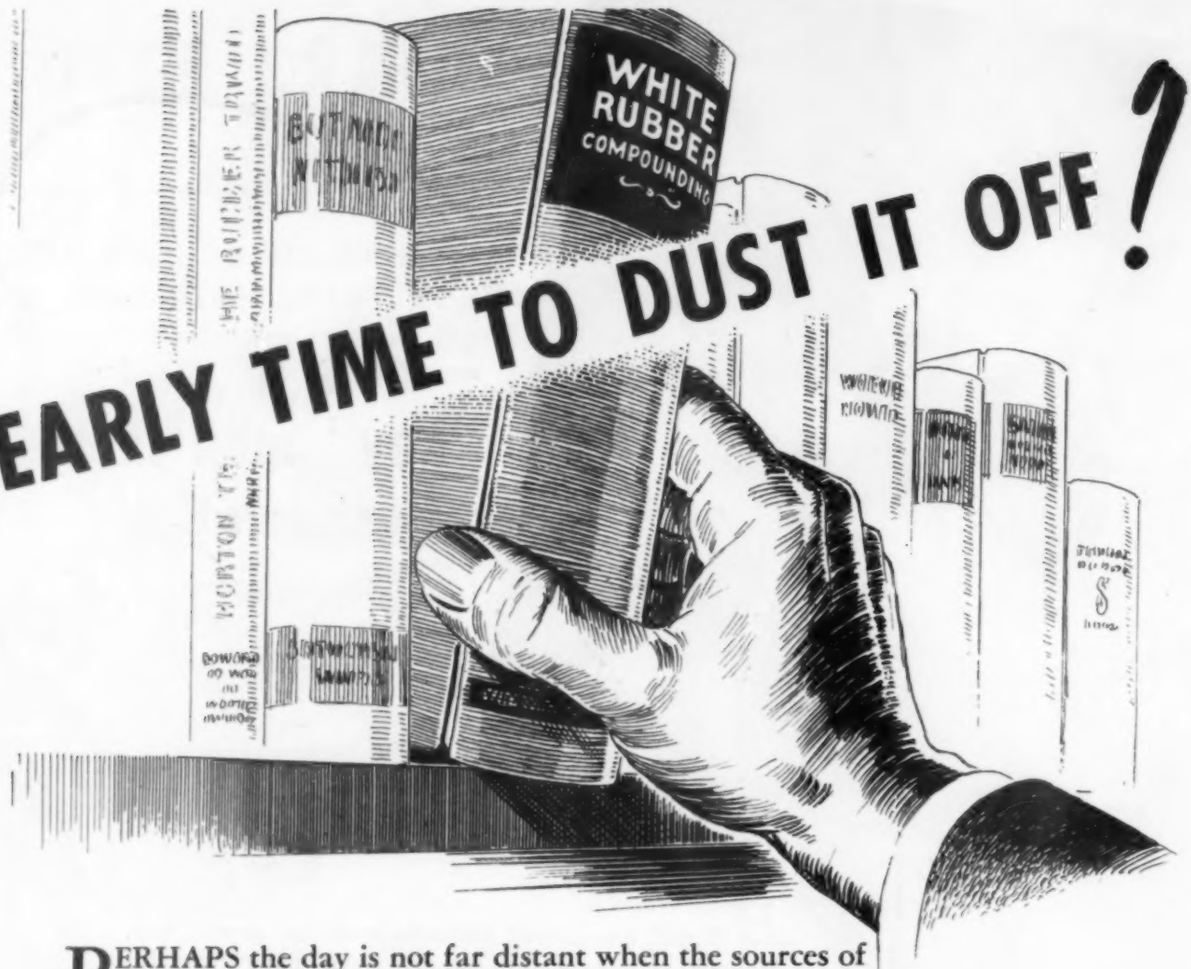
HIS skill has helped maintain a critical supply line. Millions of "automobile" miles have come from his knowledge of motors — yet he never manufactured an automobile or truck. His skill is a product of study, experience and ability through many years of application. *There is no monopoly on skill,* and, so, an essential service need is met efficiently and economically . . . We, too, have helped maintain a critical supply line. . . We have rebuilt Banbury Mixers, restoring their efficiency, maintaining essential production with a "know how" that results from years of specialized study and experience with Banbury problems. . . Leaders in the "heart of the Rubber Industry" rely upon our skill and responsibility for building maximum efficiency into Banburys — and doing it economically.

SERVING THE IWS RUBBER INDUSTRY

INTERSTATE WELDING SERVICE

Main Plant: 914 Miami Street . . . AKRON 11, OHIO . . . Phone: JE 7970

EXCLUSIVE SPECIALISTS IN BANBURY MIXER REBUILDING



NEARLY TIME TO DUST IT OFF!

PERHAPS the day is not far distant when the sources of natural rubber will be freed, and manufacturers of rubber goods again will be able to give their sparkling white products to the world.

When that day comes, TITANOX pigments will be ready in volume and quality to provide that whiteness and reinforcement which marked high quality in pre-war days.

Meanwhile in the harder-to-whiten synthetic rubber field TITANOX pigments are revealing their notable characteristics to a marked degree. High tinting strength, fine particle size and reinforcing qualities make them outstanding among white rubber pigments.

Our Rubber Service Department invites technical inquiry.

TITANIUM PIGMENT CORPORATION

SOLE SALES AGENT

111 Broadway, New York 6, N. Y.
104 South Michigan Ave., Chicago 3, Illinois • 350 Townsend St., San Francisco 7, California • 2472 Enterprise St., Los Angeles 21, Cal.

TITANOX

REG. U. S. PAT. OFF.

It's easy— when you have the "know-how"

With nearly 40 years of experience to its credit, it is only natural that our organization should have the "know-how" to assist you with rubber problems. Keep posted on market conditions...consult us frequently regarding

SYNTHETIC
CRUDE
SCRAP
Rubber

ALSO
HARD RUBBER DUST
and BALATA

LET US SERVICE YOUR RUBBER RESERVE PERMITS

H. MUEHLSTEIN & Co. INC.

122 EAST 42nd STREET, NEW YORK 17, N. Y.

CHICAGO: 327 So. La Salle St. · AKRON: 250 Jewett St. · LOS ANGELES: 1431 E. 16 St. · MEMPHIS: 46 W. Virginia Ave · BOSTON: 31 St. James Ave

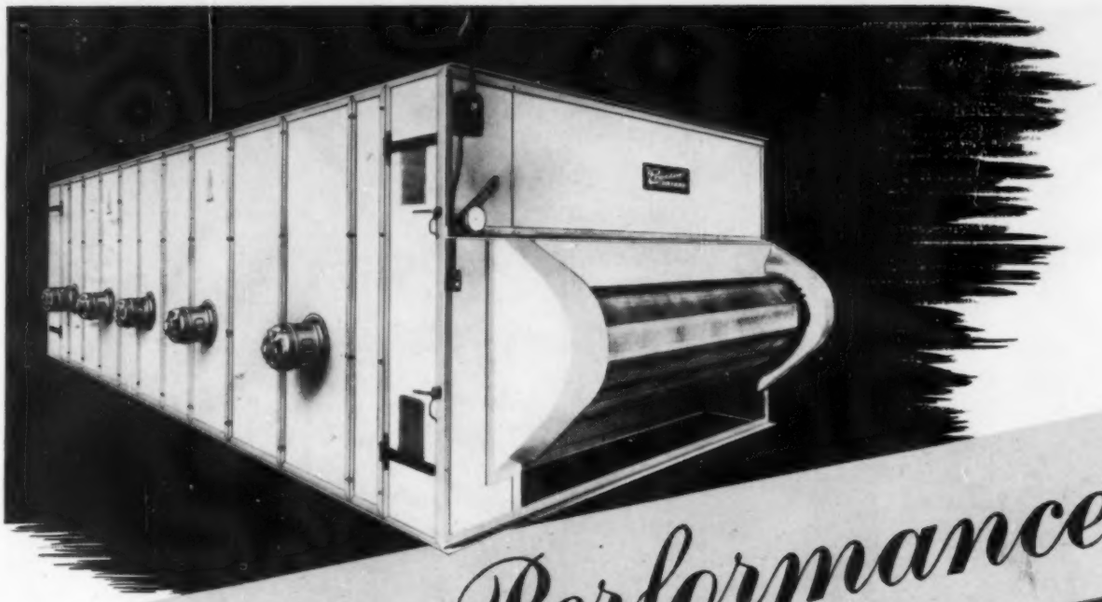
The Best Possible Reason

Peace or war, ST. JOE Lead-Free ZINC OXIDES are being used by leading manufacturers in the rubber, paint and allied industries for this reason: The precise characteristics which consumers requirements indicate as being most desirable for their respective products, can be readily imparted to our various grades. This is due to the flexibility of our patented Electro-Thermic Process by means of which St. Joe Zinc Oxides are produced direct from ores originating in the New York State mines of the St. Joseph Lead Company.

ST. JOSEPH LEAD COMPANY

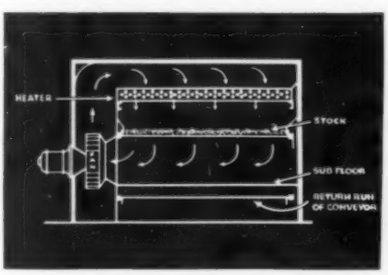
250 PARK AVE., NEW YORK, 17, N. Y.

MADE BY THE LARGEST PRODUCER OF LEAD IN THE UNITED STATES



Proven Performance

PROCTOR DRYER FOR RECLAIMED RUBBER



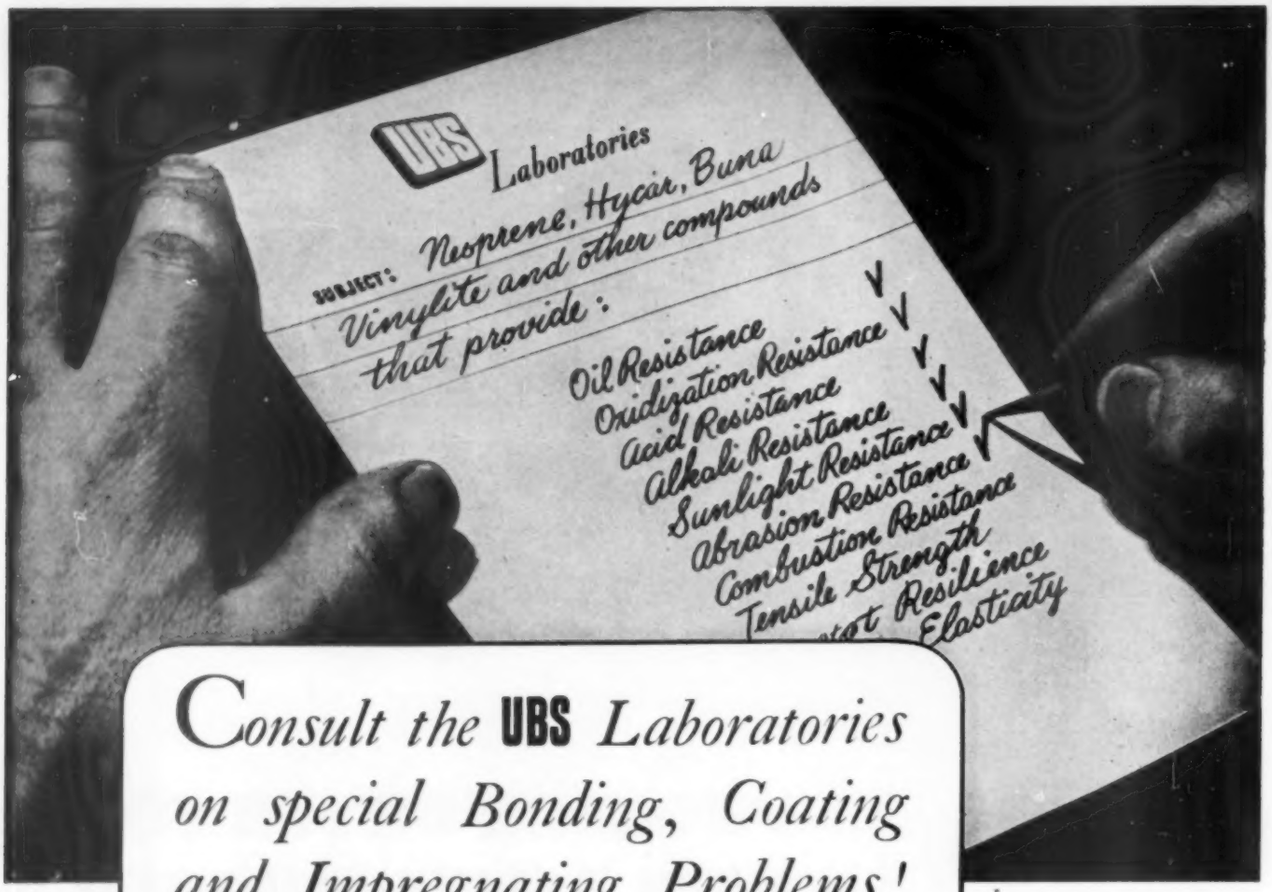
Cross section shows clearly how rubber is distributed on conveyor and how air is permitted to circulate freely through the bed of material promoting rapid, uniform drying with minimum steam consumption.

Users have found the Proctor single conveyor dryer for reclaimed rubber to be the ideal machine for speedy, correct and economical drying. Evenly distributed over a conveyor of perforated plates, the reclaimed rubber is carried through the drying chambers at the ideal speed for perfect drying. The careful control of temperatures, humidity and air-circulation possible with this machine assures maximum uniformity of the finished product. Specially designed heating coils assure efficient heating. Highly efficient insulation effectively minimizes heat loss. All around rugged construction means long, trouble-free, useful life. Greatly reduced maintenance costs further add to the economy of operation. This machine represents just one application for Proctor Dryers in the rubber industry. If you have any rubber drying problem, or anticipate such a problem in the post war period, now is the time to let Proctor engineers help you reach a practical solution.

PROCTOR DRYERS *for the* **RUBBER INDUSTRY**

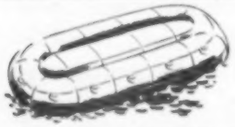
manufactured by

PROCTOR & SCHWARTZ INC · PHILADELPHIA · PA

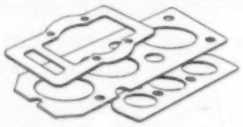


Consult the **UBS** *Laboratories on special Bonding, Coating and Impregnating Problems!*

No matter what the problem may be — *bonding neoprene, rubber and other coated or moulded parts to any ferrous or non ferrous metal; corrosion proofing chemical tanks and equipment; laminating leather belting; coating magneto parts; combining or coating fabrics; impregnating paper; cementing various materials together; insulating wire and other articles; etc.* — you will find the UBS Laboratories equipped to provide the one best formula to suit your needs. Longtime specialists in the field of industrial Bonding, Coating, and Impregnating Compounds, the UBS Laboratories not only know thoroughly the compounding advantages and limitations of all the latest synthetics, but even have developed an original synthetic latex and synthetic rubber of their own. *Write today, describing your Bonding, Coating, or Impregnating Problems.*



UBS developed adhesives are being used in the manufacture of inflatable Army and Navy Equipment, where weather and chemical resistant seams of high tensile strength are required.



UBS developed compounds are being successfully used to coat magneto parts and for cementing gaskets, where oil resistance is of great importance.

UBS developed adhesives and coating compounds are being widely used on Army delousing bags, protective clothing, etc., where acid resistance and flame resistance are of paramount importance

UBS developed compounds are being used for chemical tank linings and to corrosion proof chemical handling equipment, where acid resistance and alkali resistance are primary factors.

Address all inquiries to the Union Bay State Chemical Company, Rubber Chemicals Division, 50 Harvard Street, Cambridge 42, Massachusetts.

UBS

UNION BAY STATE *Chemical Company*

Serving Industry with Creative Chemistry

ORGANIC CHEMICALS · SYNTHETIC LATEX · SYNTHETIC RUBBER
PLASTICS · INDUSTRIAL ADHESIVES · DISPERSIONS
COATING COMPOUNDS · IMPREGNATING MATERIALS · COMBINING CEMENTS

Technical Bulletin No. 3

on the compounding of GR-S with Substantial Loadings of Zinc Oxide

Results with Benzothiazyldisulfide Accelerations

SOMEWHAT higher tensiles are realized with this compound than with those previously reported. The resilience properties are better than Compound No. 1 and the heat generation and cut-growth are low.

COMPOUND NO. 3

GR-S	100.0
Sulfur	3.0
Benzothiazyldisulfide	2.0
E.L.C. Magnesia	5.0
Cumar MH2 ½	7.5
Zinc Oxide	100.0

ORIGINAL RESULTS

Time of Cure Min. at 45 Lb.	Tensile Strength Lb./Sq. In.	Percent Elongation	Load (Lb./Sq. In.) For Elongation of			Permanent Set
			200%	300%	400%	
7.5	1370	670	195	235	315	.23
15	1740	670	200	275	395	.27
30	1255	560	235	350	510	.18
45	1650	610	235	315	470	.24
60	1050	530	240	320	485	.14
90	1240	575	200	280	440	.17

Time of Cure Min. at 45 Lb.	Shore Hardness	Goodyear-Healey Pendulum		Compression Fatigue (Goodrich Flexometer)*					Cut-Growth Resistance Inches—Failure at	
		Indentation in mm.	Per Cent Rebound	Per Cent Initial Comp.	Running Time and Per Cent Permanent Set	Max. Temp. Rise °C.	Dynamic Compression			
							Initial	Final	4,000 Cyc.	13,000 Cyc.
90	48	8.30	61.2	23.4	15′— 3.6	14.2	14.2	17.0	.14	.38

*Test Conditions: 100 Lb. Load. 0.15″ Stroke. 100°C. Oven Temp.

The tear resistance of Zinc Oxide compounds on the original specimen tested at both room temperature and 100°C. is much lower than might be anticipated from the natural rubber analogy. This subject is receiving special attention and will be reported on later.

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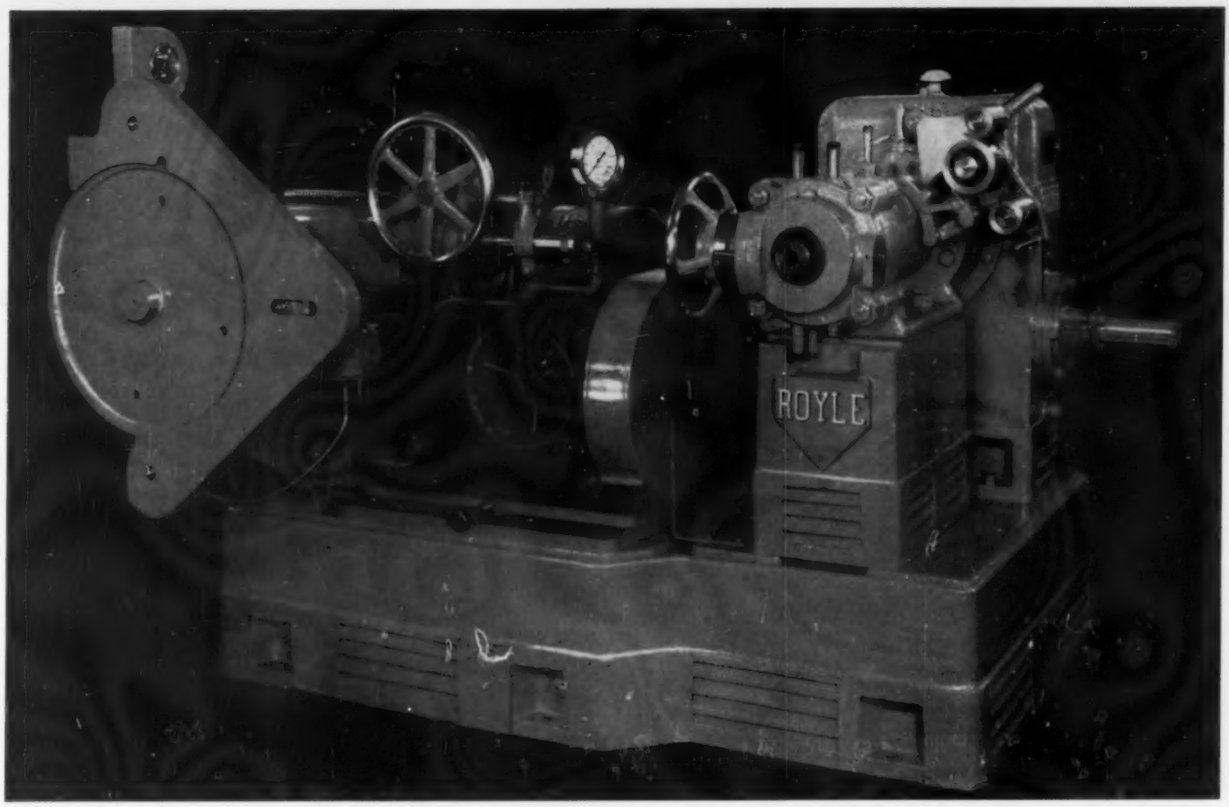

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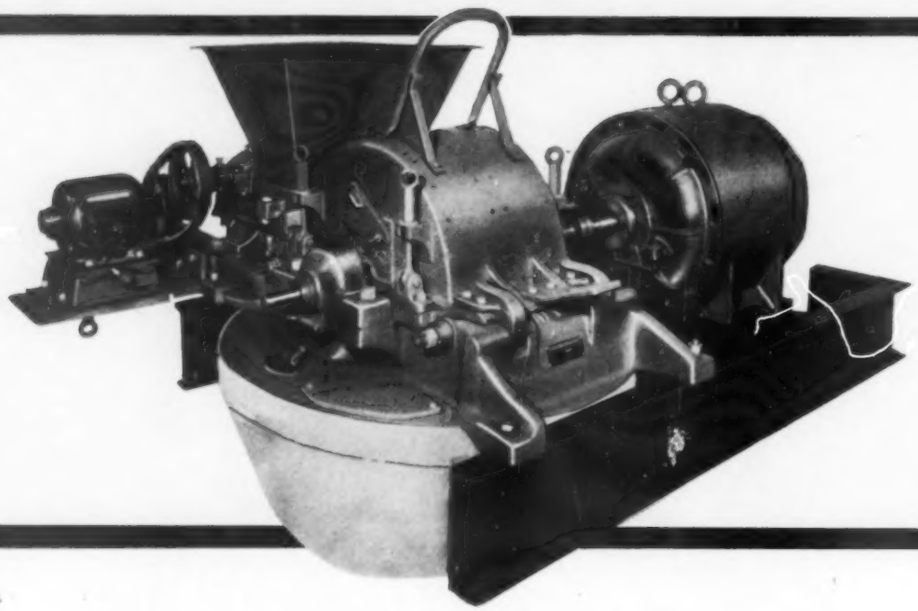

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VOLUME 55
NUMBER 6

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Published on the 15th of each month by

PALMERTON PUBLISHING COMPANY, INC.

Printing office,
East Stroudsburg, Pa.

Editorial and Advertising Offices,
250 West 57th St., New York 19, N. Y.

New England Representative—F. ROYAL CAREY, P.O. Box 133, Providence, R. I.
Western Representative—IRVING V. KOCH, 64 East Lake St., Chicago, Ill.

Entered as Second Class Matter, October 20, 1933 at the Post Office at East Stroudsburg, Pa., under Act of March 3, 1879. Subscription Rates: Domestic, $3.00 a year; Canada, $3.50; Foreign, $4.00. Single copies up to 3 months old, 35 cents; over 3 months old, 50 cents. Telephone COlumbus 5-2923, 5-2924.

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Indexed in Industrial Arts Index. OFFICERS: P. L. Palmerton, President; E. D. Osborn, Vice-President and Secretary; Peter P. Pinto, Treasurer.

Also Publishers of:

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Bibliography of latex patents and literature to June, 1932.

LATEX AND RUBBER DERIVATIVES AND THEIR INDUSTRIAL APPLICATIONS (Vols. II & III)
By Frederick Marchionna
Bibliography of latex patents and literature from June, 1932 to January 1937; rubber derivatives to January, 1937.

3 IMPORTANT SUGGESTIONS For Your GR-S Stocks

1 To protect the polymer during processing, particularly the effects of high temperatures in breakdown or mixing, add one percent (on 100 GR-S) of

BLE-POWDER

2 To protect your GR-S products from effect of static exposure to sunlight and ozone, add one to three percent (on 100 GR-S) of

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3 To protect your GR-S products in service, to maintain their best characteristics over the maximum time, accelerate the compounds with a thiuram

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The RUBBER AGE

VOL. 55, No. 6 SEPTEMBER, 1944

Incorporation of Carbon Black into GR-S Latex (on a Production Scale)

by RONALD L. RONGONE, CHARLES B. FROST and GILBERT H. SWART

Research Laboratory, General Tire & Rubber Co., Akron, Ohio.

DURING the period from 1910 to 1920 the value of carbon black in imparting superior wear resistance to rubber goods was first recognized and utilized commercially. This new use resulted in the development of specialized types of carbon blacks for the rubber industry. Following 1920 the use of carbon black as a reinforcing agent for rubber became firmly established as part of the accepted compounding art. When synthetic rubbers came into general use it was found that the incorporation of carbon black was even more essential in obtaining quality than was the case with natural rubber. Unlike natural rubber, synthetic rubbers of the GR-S type (butadiene-styrene rubber made in the Government plants) are not capable of giving high quality pure gum stocks or high grade light-colored stocks. GR-S must be reinforced with carbon black or with a mixture of carbon black and other pigments if its physical properties are to be adequate for hard usage.

The replacement of natural rubber by GR-S is further complicated by the inherent resistance of GR-S to breakdown by milling. Crude natural rubber is normally a tough, elastic material which changes to a soft, plastic substance when masticated in air. GR-S, on the other hand, while initially softer than natural rubber, does not show comparable breakdown characteristics. In order to make GR-S processable, higher temperatures are required as well as longer milling times. Even with increased times and higher temperatures of milling, GR-S could not be satisfactorily processed on existing equipment without the use of large amounts of softeners.

Because of these difficulties in breaking down GR-S, it was estimated early in the conversion program that GR-S would require at least 10% more milling capacity than natural rubber. As a result of this need for increased milling capacity, the rubber industry faced a curtailment in the production of tires and other rubber goods at the very time these products were most needed in the war effort. To offset this calculated loss of production, considerable sums were made available for an increase in milling equipment. Now having acquired the necessary machinery, the industry finds itself hard-pressed to obtain the men necessary to keep the equipment in operation.

Since carbon black was known to be necessary for good physical properties of GR-S and since GR-S was available in large quantities as a latex it was obvious to try to mix the two. Many foreign and domestic patents and publications, including a ten-year old British patent, disclose the mixing of carbon black, pigmenting materials, and compounding ingredients with natural and synthetic rubber latex.* Carbon black, pigmenting materials and compounding ingredients have been added to natural rubber latex to make commercially produced pigmented products by deposition, but in such products the rubber was not reinforced by the carbon black.

From the study of many patents and of much literature on these matters, it was evident that helpful and important economies would result if carbon black could be added to GR-S latex on a production scale and obtain a uniform dispersion of the carbon black within the rubber. Realizing the tremendous benefits to the industry and to the war effort that would follow from a solution of these problems, the General Tire & Rubber Company decided to enter this field and attempt a commercial solution of the problem.

Laboratory Investigation

There are a number of ways to add carbon black to latex which appeared to promise success, but most of these presented technical difficulties. The direct addition of dry carbon black to latex did not ordinarily give a good dispersion of black and usually caused partial coagulation of the latex. The use of a wetted black or of a slurry of black in water alone caused trouble with agglomeration of the black in the rubber which was difficult to disperse. Handling problems were also increased, since a water slurry with carbon black (easy processing channel) of a content higher than 10% is unworkable and the black settled out from the latex mixture too fast to be practical in the available equipment. However, a good dispersion of carbon black

* Included among the more important patents are the following: U. S. Patents—Nos. 1,610,226; 1,611,278; 1,802,761; 1,802,764; 1,807,355; 1,822,548; 1,862,270; British Patents—Nos. 250,279; 273,961; 282,011; 368,256; French Patents—Nos. 679,992; 697,568; 700,533. Included among the important publications are: W. McMahon and A. R. Kemp, *Ind. Eng. Chem.*, Vol. 36, p. 375 (1944); H. F. O'Connor and C. W. Sweitzer, *R. A. (N. Y.)*, Vol. 54, p. 424 (1944).

TABLE I—COMPOUNDING FORMULA

Polymer	100.
EPC black *	45.
Zinc Oxide	5.
Sulfur	1.7
Santocure	1.2
Stearic Acid	2.5
BRT No. 7	5.

* Black dispersed in latex or on mill as indicated.

which reduced these tendencies and one which blended readily with latex was obtained by the use of proper dispersing agents. The dispersion was readily made by mixing carbon black, water and dispersing agent and grinding them together in a ball mill or colloid mill.

The most specific dispersing agents for carbon black can apparently be divided into three classes: (1) condensation products of naphthalene sulfonic acid and formaldehyde, such as Darvan 1, Daxad 11, Tamol R, etc.; (2) the lignin sulfonic acids or salts such as Hornkem No. 1, Marathon Agent 340-2, etc.; and (3) glucoside extracts such as Hornkem No. 12, quebracho extract, tannin extract, etc.

The carbon blacks to be dispersed present individual problems because of particle size, state of aggregation and the character of the surfaces, as well as the nature of the adsorbed gases. A rough test for the dispersing power of any agent can be obtained by making a heavy paste of unpelletized carbon black and water on a glass plate and determining the total amount of dispersing agent and water required to transform a stiff paste to a fluid mixture. For final selection of the best from a group of good dispersing agents, it is recommended that viscosity and settling tests be made on slurries containing various amounts of black, dispersing agent and water. This sort of test indicated that quebracho extract, Daxad 11, Darvan 1 and Tamol R were suitable dispersing agents for the ordinary types of carbon black.

For commercial and economic reasons it is important to use the minimum amount of dispersing agent to give a reasonably stable slurry that will blend readily with the latex. This minimum concentration of dispersing agent was found from a series of experiments in which different amounts of dispersing agents were used to stabilize carbon black slurries made in a colloid mill. It was immediately evident that very low amounts of dispersing agent were insufficient to promote fluidity and freedom from settling in a reasonably concentrated slurry (20 to 25% solids). On the other hand, excessive amounts of dispersing agent tended to cause the formation of too many fines on coagulation and the loss of considerable black in the mother liquor. Black rubbers compounded to the formula shown in Table I were milled and tested. The results of these physical tests are shown in Table II.

An examination of the data in Table II indicates that no better physical properties result from the use of increased amounts of dispersing agent. Therefore, the use of the lowest amount of this type material which would give the best handling is indicated. Most of the subsequent work was done on a system containing 75 parts water, 25 parts carbon black and 0.75 parts Tamol R. This type of dispersion is still fluid and has little tendency to settle out.

Early in our investigation it was necessary to determine the effect which increasing the degree of dispersion of the carbon black in the water slurry had on the physical properties of the rubber. By preparing dispersions with high percentages of dispersing agents and doing considerable work on the dispersion by running it through a closely set colloid mill several times, excellent black dispersions were obtained. Other dispersions were made with decreasing percentages of surface active materials and with less mechanical grinding. The extreme was to use no dispersing agent and run the black and water one pass through a colloid mill. When these various dispersions were mixed with latex and coagulated, the physical properties of the cured rubber mixes were very similar and did not reflect the extreme differences in the degree of dispersion of the black in the water.

The conclusion we reached from this particular work was that if the size of the aggregates of carbon black were considerably less than some definite maximum (less than the bead size) when deposited with the rubber, the shearing action of a pass or two through a mixing mill was sufficient to give good dispersion. For our subsequent work, uncompressed black was stirred into water and dispersing agent with simple stirring, thus eliminating entirely the use of colloid mills and ball mills.

Another method has been advocated with considerable advantage listed for it. The black in this method was dispersed in the normal way and then flocculated with alum. After flocculation, the alum was neutralized with a base. This flocculated black was then

TABLE II—EFFECT OF VARYING AMOUNTS OF DAXAD NO. 11

Daxad No. 11 % on Black	Cure at 292° F. (min.)	Tensile Strength (lbs./sq. in.)	Stress at 300% Elongation (lbs./sq. in.)	Elongation at Break (%)
0 *	25	2270	535	705
	50	2370	800	575
	75	2630	920	570
0 [a]	25	1910	350	860
	50	2615	745	660
	75	....	...	...
1 [a]	25	1370	220	880
	50	2530	690	660
	75	2630	800	570
3	25	970	170	1010
	50	2445	340	780
	75	2525	495	720
6	25	1435	250	865
	50	2610	585	700
	75	2480	660	620
10 [b]	25	1915	600	880
	50	2620	580	720
	75	2370	730	640
14 [b]	25	1125	165	1000
	50	2475	455	765
	75	2875	620	700

* Control batch, black added on mill. [a] Viscous slurry in water. [b] Incomplete retention of black on coagulation and washing because of excessive dispersing agent.

mixed with the latex and coagulated in the standard way. It is claimed that this flocculated black gives more stable suspensions in water and has less tendency to settle out than the type of dispersion described above and has less tendency to "bleed out" from the rubber.

The coagulation of a mixture of black and latex may be accomplished in numerous ways. Acid alone; a mixture of salt and acid; mixtures of salt, acid and alum; alum alone and zinc chloride alone (O'Connor & Sweitzer, *supra*) have all been used successfully as coagulating agents. Coagulation of the black latex is best accomplished by the use of some sort of rapid, one-step coagulation rather than the conventional method used for GR-S. This type of "shock" coagulation is best suited to entrap all the black in the coagulated rubber and to produce a clear mother liquor. Table III shows a summary of some of the methods of coagulation which have been tried. From the data in this table it is clear that little change in the physical properties of these stocks is caused by the coagulation method and that the actual choice of a method must depend on operating conditions in the plant.

Because of its open, porous structure the black pigmented crumb is readily dried. From time to time in the early part of this work it was observed that certain dried samples did not possess good physical properties whereas others of apparently the same character had superior characteristics. Further investigations and a study of these samples indicated that the presence of moisture during milling brought the curing rate at least up to normal and gave superior properties to the compound. These effects on the properties of the rubber are shown in Table IV. After this observation, it was found that the retention of moisture in the milled coagulum eliminated the previously unexplainable differences in quality of comparable cured stocks and produced uniformly good physical properties.

In summary it may be said that laboratory work on this problem showed that it was possible to make a cheap, satisfactory slurry of carbon black, that this slurry could readily be mixed with latex, and that the mixture could be coagulated to produce a black rubber which has properties at least as good as those of GR-S into which carbon black had been incorporated by the conventional mill method. These developments made it desirable to try the process on a commercial scale.

TABLE III—EFFECT OF DIFFERENT METHODS OF COAGULATION

Coagulating Agent	% Agent on Rubber-Black Solids	Cure at 292° F. (min.)	Tensile Strength (lbs./sq. in.)	Stress at 300% Elongation (lbs./sq. in.)	Elongation at Break (%)
H_2SO_4	2*	25	2260	330	895
	—	50	2140	650	595
	—	75	3080	750	670
H_2SO_4	1	25	2620	470	800
NaCl	15*	50	3220	660	705
	—	75	2900	735	650
Alum	1	25	2800	570	715
H_2SO_4	1	50	2850	720	650
NaCl	15	75	3240	850	630
Alum	4.5	25	2400	515	705
	—	50	2640	710	650
	—	75	2900	755	625
$ZnCl_2$	4	25	835	115	1085
	—	50	2645	405	805
	—	75	3200	570	760

* Higher percentage recommended for satisfactory coagulation.

TABLE IV—EFFECT OF MOISTURE

Sample	Bone Dry			Moist		
	Tensile (lbs./sq. in.)	300% Modulus (lbs./sq. in.)	Elongation (%)	Tensile (lbs./sq. in.)	300% Modulus (lbs./sq. in.)	Elongation (%)
1	1520	450	690	2720	560	710
2	1775	395	760	2830	1030	590
3	995	220	920	2980	745	670
4	1560	275	925	2600	595	755
5	1310	835	420	2360	690	735

Note: All samples were cured 50 minutes at 292° F.

Preliminary Production Scale Operations

During the early part of March of this year the first incorporation of carbon black into latex on a production scale was made at the Government GR-S plant at Baytown, Texas, operated by the General Tire & Rubber Company and General Latex, Inc. Six runs of some 10,000 pounds each were made using different types and amounts of dispersing agents, different carbon blacks, and variations in plant handling. Both the flocculated and dispersed types of carbon black slurry were successfully blended with latex at this time. This work indicated that the system was adaptable to existing plant processing equipment with minor changes. A brief description of these runs is listed in the table below:

Run No.	1	2	3	4	5	6
Carbon Black	W-6	Statex-93	W-6	W-6	W-6	W-6
Dispersing Agent	Daxad-11	Daxad-11	Quebracho	Daxad-11	Daxad-11	Daxad-11
% Dispersing Agent on Black	4.2%	2.7%	4.0%	4.2%	4.2%	3.0%

Plant scale runs required a carbon black slurry which could be rapidly prepared with a minimum of equipment and mechanical work, possessing sufficient fluidity to be readily pumped and stable enough to prevent settling under handling conditions. In the initial work, uncompressed black was added to the dispersing agent solution in a tank agitated by a Lightnin' Mixer. The rate of wetting of the black determined the speed at which it could be added.

The method of coagulation of the dispersed carbon black-latex mixture differed from that of standard GR-S mainly in the elimination of the creaming step and the use of "shock" coagulation of the black and the rubber. Using salt and acid for coagulation it was found desirable to use higher concentrations of both salt and acid than are normal in present plant practice and to use them concurrently. This was the case since it was preferable that the black and rubber be "set" as instantaneously as possible. A small amount of alum in conjunction with acid and salt materially reduced the required quantities of the latter. It was found that

TABLE V—COMPOUNDING RECIPES

Stock No.	1	2	3	4
Rubber	100.	100.	100.	100.
W-6 black	45.	45.	...	...
Statex 93 black	...	...	52.	48.*
Zinc Oxide	3.0	3.0	3.0	3.0
Sulfur	1.7	1.7	1.7	1.7
Santocure	1.3	1.3	0.8	0.8
Stearic Acid	1.0	1.0	2.0	2.0
Stabilite	0.5	0.5	0.3	0.3
Turgum	3.0	3.0	..	..
Bardol	4.0	4.0	3.0	3.0
Pine Tar	3.5	3.5	2.0	2.0
B.L.E.	0.3	0.3	0.3	0.3
Black Added	On mill	In latex	On mill	In latex

* % Carbon black by analysis of latex masterbatch.

TABLE VI—MIXING PROCEDURE FOR FACTORY BANBURY BATCHES

GR-S Control Tread Stock

(1) Add crude rubber and Turgum and run to 4 minutes.
(2) Add dry black and run to 9 minutes.
(3) Add dry ingredients, except Santocure, and run to 11 minutes.
(4) Add oils and run to 14 minutes.
(5) Add Santocure and run to 15 minutes.
(6) Dump for a total time of 17 minutes.
(7) Add sulfur on open mill.

Latex-Black Tread Stocks

(1) Add black masterbatch and Turgum and run to 2 minutes.
(2) Add dry ingredients, except Santocure, and run to 4 minutes.
(3) Add oils and run to 7 minutes.
(4) Add Santocure and run to 8 minutes.
(5) Dump for total time of 10 minutes.
(6) Add sulfur on open mill.

the most effective method of controlling crumb size and eliminating fines was to avoid excessive agitation during coagulation.

The black pigmented rubber crumb obtained from the coagulation was easily dewatered and sufficiently dried in conventional equipment. The drying rate of the pigmented crumb was faster than normal because of its porous structure. In continuous plant operation it should be possible to effect a substantial reduction in the drying cycle. Furthermore, the crumb did not tend to stick or gum-up the dryer apron. Thus, delays in plant production due to shutdowns for cleaning the dryers should be minimized.

Although the resulting pigmented rubber crumbs can readily be baled and packed in the conventional manner, it is probable that some savings in packaging costs will be made possible by the firmness of the bale of black rubber. A standard size bale of black rubber weighs about 90 pounds rather than 75 pounds which is the conventional weight for a bale of GR-S.

Factory Processing and Physical Tests

Factory evaluation studies on commercial latex-mixed black rubber were made by using the factory tread formulations and the mixing technique ordinarily used for GR-S in General Tire's Akron plant. The mixing times of the carbon black-latex stocks were adjusted to give a final mix comparable in processing characteristics to that obtained when dry black was mixed with GR-S. Tables V and VI give the mixing recipes and mixing procedures for a 1000-pound batch in a Number 27 Banbury with a rotor speed of 20 rpm.

It should be noted that the latex-black samples took only 10 minutes in the Banbury to reach satisfactory processing characteristics as compared to 17 minutes for conventional mixing. This represents a saving of about 40% in processing time. It was also noted that the Banbury temperatures of the latex-black stocks were considerably lower than those of the controls. Comparative operating temperature curves are shown in Figure 1.

A Number 11 Banbury was used to study the comparative power requirements for mixing batches of black-latex rubber compared with ordinary GR-S mixed with dry black. In this size equipment a 400-pound batch of GR-S tread stock normally required 10

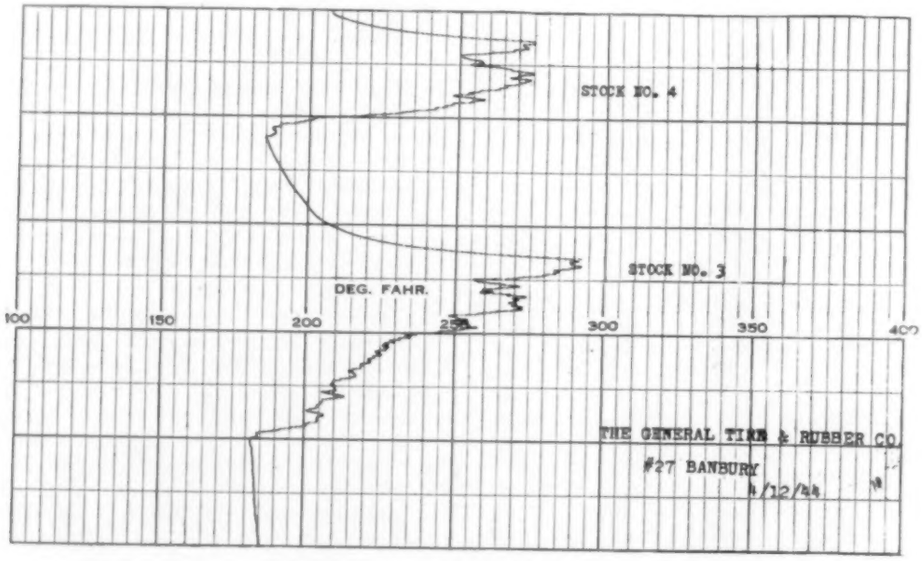
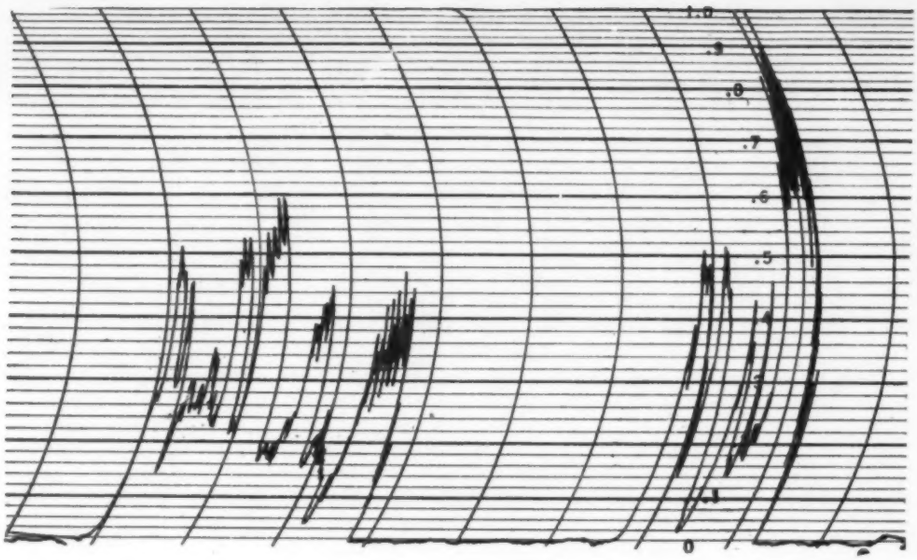


FIG. 1—Comparative Operating Temperature Curves.



Stock No. 1 (GR-S Control)
305 H.P. (Average)—44.8 K.W.H.
$0.358

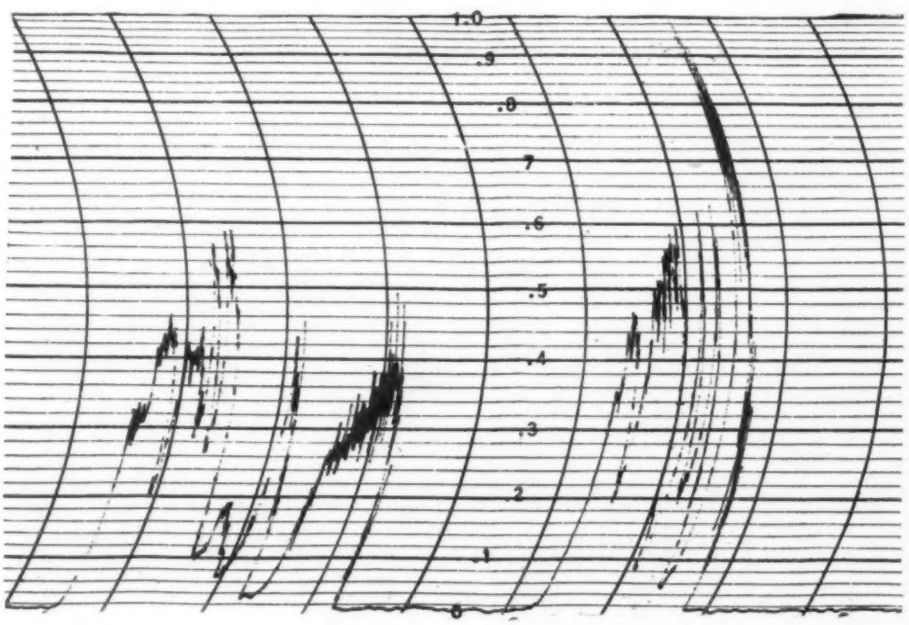
Stock No. 2
312 H.P. (Average)—26.2 K.W.H.
$0.210

FIG. 2—Power Consumption—No. 11 Banbury—W-6 Type Mixing.

minutes for mixing compared to 6 minutes for a black-latex stock. The power consumption during mixing was measured by means of a recording power meter installed in the motor circuit. Average power requirements, total work, and peak loads were estimated from the resulting charts. Typical power data are shown in Figures 2 and 3.

In general, the power charts show that the latex-mixed stocks require more power on the average and at the peak load than does the control, but that in spite of these larger requirements the total power consumption per batch is at least 20% less for the black-latex stocks than for the direct mix. This saving is, of course, a reflection of the greatly decreased mixing time.

Tubing and other processing characteristics of the black-latex stocks were at least as good in every way as the controls. Tire building operations were normal and no difficulties were experienced in building test tires.



Stock No. 3 (GR-S Control)
260 H.P. (Average)—37.5 K.W.H.
$0.300

Stock No. 4
385 H.P. (Average)—29.9 K.W.H.
$0.239

FIG. 3—Power Consumption—No. 11 Banbury—Statex 93 Type Mixing.

TABLE VII—TYPICAL COMPARATIVE RESULTS OF CONVENTIONAL FACTORY-MIXED STOCKS WITH BLACK-LATEX STOCKS

Cures @ 287° F.	Stock No. 1				Stock No. 2				Stock No. 3				Stock No. 4			
	25′	50′	75′	90′	25′	50′	75′	90′	25′	50′	75′	90′	25′	50′	75′	90′
Original Tested @ R. T.																
Tensile	1290	2000	2340	2340	1055	2485	2655	2780	1370	2215	2205	2060	605	2110	2115	2000
Elongation	915	680	655	610	1050	815	780	750	755	645	570	525	855	730	620	570
M/300%	180	505	630	715	165	425	475	555	350	815	925	1030	120	580	820	880
Original Tested @ 100° C.																
Tensile	490	550	545	560	515	635	750	685	490	755	725	810	175	800	785	775
Elongation	545	360	300	250	695	485	425	395	410	320	260	260	550	420	310	310
M/300%	145	405	...	...	121	270	430	500	315	660	...	...	55	535	755	715
Oven Aged 48 Hrs. @ 100° C.																
Tensile	1910	2000	2310	2045	2950	2780	2375	2655	1650	1990	2030	1795	1845	1810	1970	1940
Elongation	380	375	420	380	485	510	460	510	250	280	310	290	340	285	320	320
M/300%	1310	1390	1410	1385	1225	1340	1355	1275	...	...	1970	...	1600	...	1795	1750
Oven Aged Tested @ 100° C.																
Tensile	535	605	655	755	750	690	830	745	670	620	760	705	465	655	625	670
Elongation	145	165	170	165	230	215	230	225	140	120	125	130	130	125	125	125
Mooney on Compounded Stock 4 Min. Reading			62.5				55.				42				40	
St. Joe Flexometer Cured @ 287° F.			90′				90′				90′				90′	
Final Temp., °F.			269				275				265				254	
Goodrich Flexometer Cured @ 287° F.	40′		60′		40′		60′		40′		60′		40′		60′	
Vertical Load 175#/.175"																
Minutes	30		30		30		30		30		30		30		30	
Final Temp., ° F.	183		165		247		202		246		226		296		240	
Goodyear-Healy Rebound Cure	60′				60′				60′				60′			
Rebound	51.0				49.1				57.6				56.9			
DeMattia Flex Crack Cure	40′		70′		40′		70′		40′		70′		40′		70′	
Cycles	40,000		40,000		40,000		40,000		80,000		70,000		80,000		70,000	
% Cut Growth @ R.T.	275		400		100		225		250		275		125		275	

Physical tests on both factory and laboratory mixes of these black-latex stocks show that they are comparable in every respect with GR-S and may actually possess some advantages over GR-S into which dry black has been mixed. Typical comparative results of conventional factory-mixed stocks with black-latex stocks are shown in Table VII. These figures show that the latex mixed samples tend to have lower modulus with higher tensiles and elongations. These findings have been confirmed in other laboratories and represent what would be expected from better dispersion.

From road tests on 6.00 x 16 passenger tires run for approximately 17,000 miles at 60 mph the latex-mixed tires were rated slightly better in regard to tread wear than the control and equal in crack resistance. This means that these special tires are at least comparable in all respects with tires made from standard GR-S mixed in the conventional way.

Plant Conversion

The excellent results of the quality and processing tests on these first factory scale runs induced Government permission to convert to commercial practice one-fourth of the 30,000-ton Government plant operated by the General Tire & Rubber Company at Baytown, Texas. The desirability of handling carbon black in bead form is obvious from a production and economy standpoint. The production installation was made on the basis of handling the black in bead form. Disintegration of the beads was accomplished by the use of an impact pulverizer manufactured by the Pulverizing Machinery Company. Although it was first believed necessary to pulverize the beads while dry it was found preferable to make a wet disintegration of them in one step which simplified the whole slurry preparation. The other steps are carried on essentially the same as made in the first plant run.

Conclusions

1. A commercially feasible method for adding carbon black to latex has been developed and tested. The black-latex mixture can be handled in essentially the same way as normal GR-S throughout the various steps of coagulation, washing, drying and baling.
2. By incorporating black into GR-S latex, an increase in milling capacity of about 35% is possible.
3. The total power required for mixing this black-rubber is at least 20% less than for tread stock mixed in the conventional way.
4. Mixing temperatures are lower for latex-black stocks.
5. Physical properties and preliminary tire tests show that carbon black incorporated with the latex produces stock equivalent in physical properties to stocks prepared by mixing carbon black into dry rubber.
6. Considerable savings are made possible by the use of this method.
7. The amount of dirt now present in the millrooms of the rubber manufacturing plants should be greatly reduced.

ACKNOWLEDGEMENT

We are grateful for the helpful suggestions and constructive criticisms of L. J. Venuto, of the Binney & Smith Co., and H. F. O'Connor, of the research department of the Columbian Carbon Co. William Sheldon, of the Pulverizing Machinery Co., also gave unstintingly of his knowledge and experience. Without the cooperation of Dr. J. H. Faull and J. Keith, and their respective technical and engineering staffs, the plant scale production would have been impossible. Finally, the authors wish to thank Dr. J. C. Butler, Guy Reymond and Robert Baker, of the research staff of the General Tire & Rubber Co., for their help in the preparation of this article.

Reinforcement of GR-I by Various Pigments

By LEONARD H. COHAN and JAMES F. MACKEY

Continental Carbon Co., Chicago, Ill.

THE behavior of carbon blacks and other pigments in various types of Butyl rubber has been reported by Haworth and Baldwin (*1*), Drogin (*2*), and Turner, Haworth, Smith and Zapp (*3*). The GR-I now being manufactured differs from Butyl only in that the diolefin used is isoprene rather than butadiene and that a slightly different percentage of diolefin is used leading to a somewhat higher final unsaturation than present in Butyl B 1.45, used in most of the previous studies.

In the present work, the effect of pigments of different particle size in GR-I has been studied. The behavior of pigments in rubber-like substances depends on:

(1) The average particle size, and particle size distribution of the pigment particles.

(2) The shape of the particles.

(3) The surface structure, *i.e.*, the chemical and physical nature of the surface of the particle.

(4) The crystal structure or chemical constitution of the particle.

In the case of carbon blacks, all grades have essentially spherical particles as illustrated by the electron

TABLE I

Pigment	Symbol	Type	Hydrocarbon Raw Material	Average Particle Size (mμ)	Surface Area M^2/gm.	Surface Structure pH	Surface Structure % Vol.	Crystal Structure Type	Crystal Structure Approx. Volume of Ultimate Crystallites (mμ)[a]
Medium Thermal	MT	Thermal decomp.	Natural Gas	270(5)	10(5)	7.3	0.42	Quasi-graphitic	13 [e]
Continex SRF	SRF	Furnace partial combust.	Natural Gas	60 [b,c]	48 [b]	9.3	0.46	Quasi-graphitic	18.5 [e]
Witcarb R	$CaCO_3$	Precipitated Calcite	.....	52 [b]	32 [b]	11.3	...	Calcite	125,000 [e]
Acetylene Black	HMF (AC)	Furnace partial combust.	Acetylene	43(5)	65(5)	5.3	2.0	Quasi-graphitic	60(6)
Continental AA	EPC	Channel partial combust.	Natural Gas	32 [b]	81 [b]	4.5	5.0	Quasi-graphitic	8.8 [d]
Continental D	MPC	Channel partial combust.	Natural Gas	27 [b]	96 [b]	4.1	5.0	Quasi-graphitic	8.8 [e]
Continental R-40	CC	Channel partial combust.	Natural Gas	10 [a]	250 [a]	4.4	4.0	Quasi-graphitic	8.0[d]

(a) Estimated. (b) Determined from electron micrographs. (c) Determined from X-ray measurements privately communicated by H. F. Roderick, Wyandotte Chemicals Corp. (d) Estimated with the aid of data in (*6*) and (*7*). (e) This figure is appreciably lower than that reported for similar blacks by previous investigators. The present value appears to correspond closely to the behavior of this pigment in various elastomers. (*5*) W. B. Wiegand and W. A. Ladd, *Rubber Age*, Vol. 50, 431-6 (1942). (*6*) J. Biscoe and B. E. Warren, *J. Appl. Physics*, Vol. 13, 364-71 (1942). (*7*) G. L. Clark and H. Rhodes, *Ind. Eng. Chem., Anal. Ed.*, Vol. 12, 66-71 (1940).

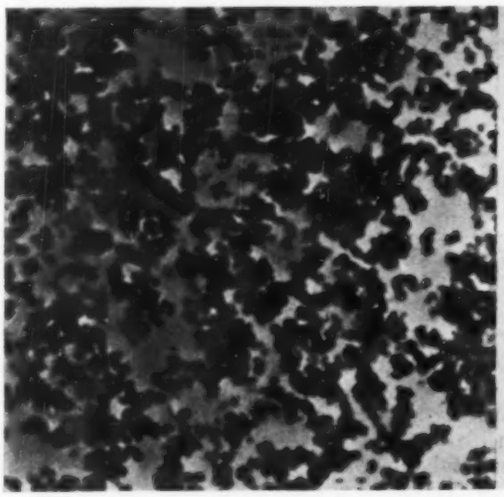


FIG. 1—Medium Processing Channel Black (Continental D).

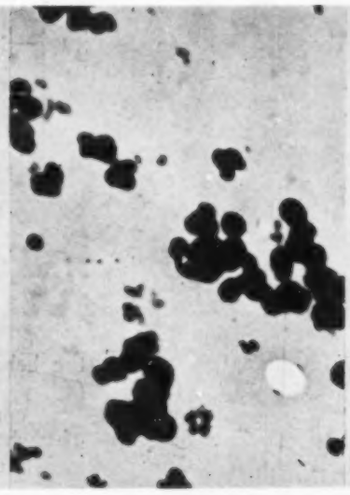


FIG. 2—Semi-Reinforcing Furnace Black (Continex SRF).

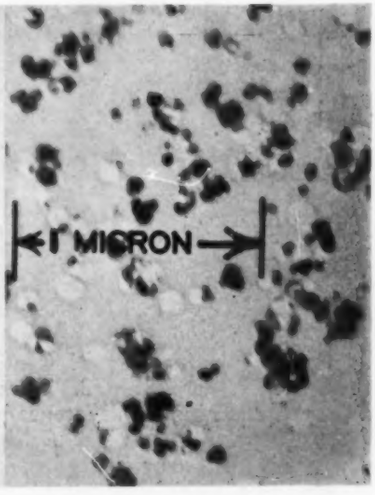


FIG. 3—Calcium Carbonate (Witcarb R).

Electron Microscope Photomicrographs (34,146 X)

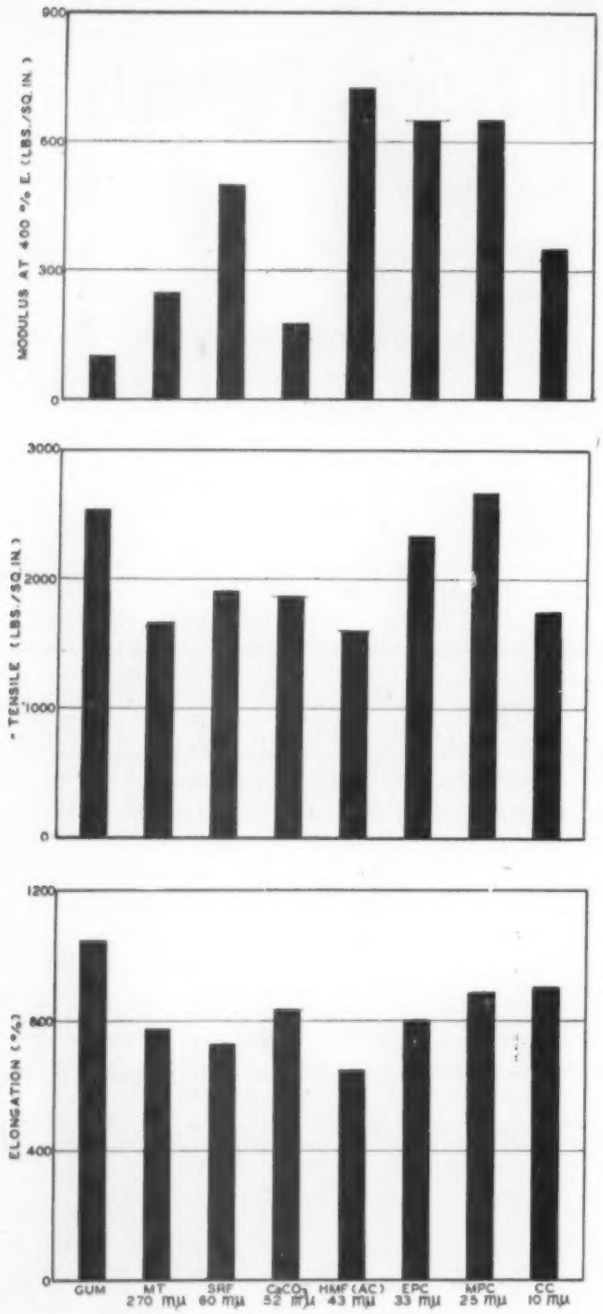


FIG. 4—Tensile, Modulus and Elongation.

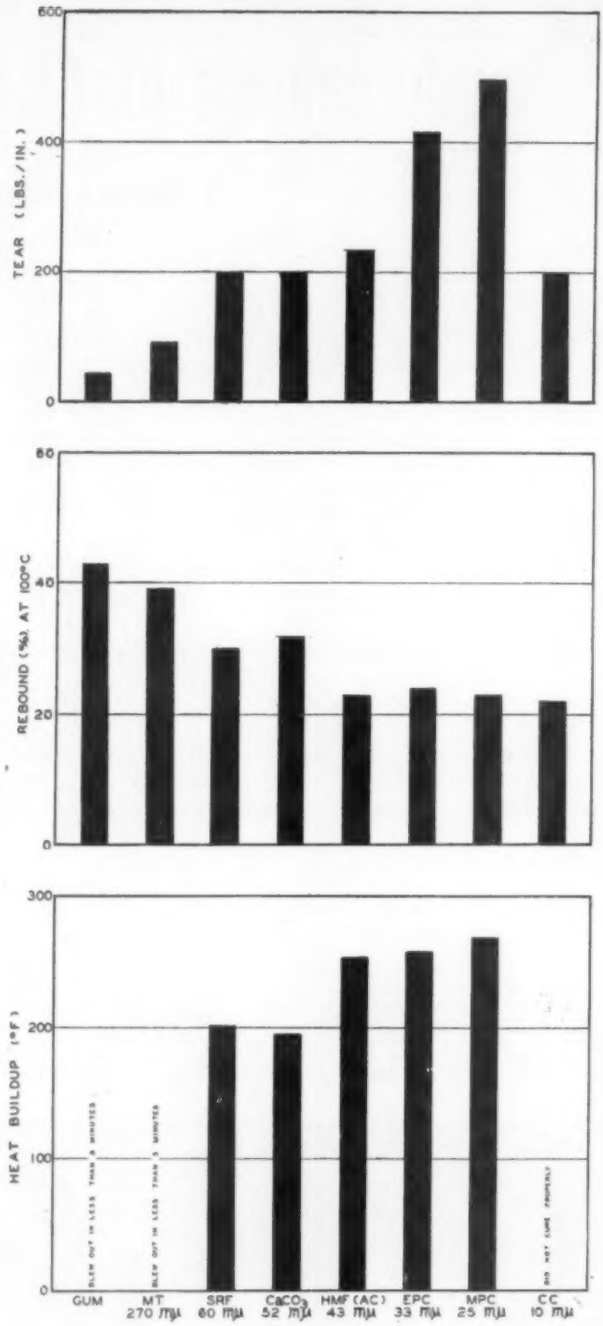


FIG. 5—Tear, Rebound (Bashore) and Heat Build-Up (St. Joe Flexometer, 20' at 475 lbs. load and .130" stroke).

microscope photographs of Continental D and Continex SRF in Figs. 1 and 2. Thus particle shape is not a factor in causing the difference in behavior of the various grades of carbon black. Since all rubber grades of channel black are prepared from very similar hydrocarbon raw materials and at not very different temperatures of formation, one might expect factors 3 and 4 to be about the same for blacks of this type. This is actually the case as indicated in Table I, and previous work has shown that both in GR-I and other elastomers particle size is the predominate factor in determining the behavior of commercial grades of *channel* black *(4)*.

In comparing non-carbon pigments and other types of carbon blacks than rubber channel black, factors 3 and 4 cannot be ignored. Fig. 3 shows that for a precipitated calcium carbonate the ultimate particles are fairly regular. Although crystal faces and corners can be observed indicating that the individual particles are probably single crystals, the particles appear to be sufficiently symmetrical so that the particle shape factor can be neglected.

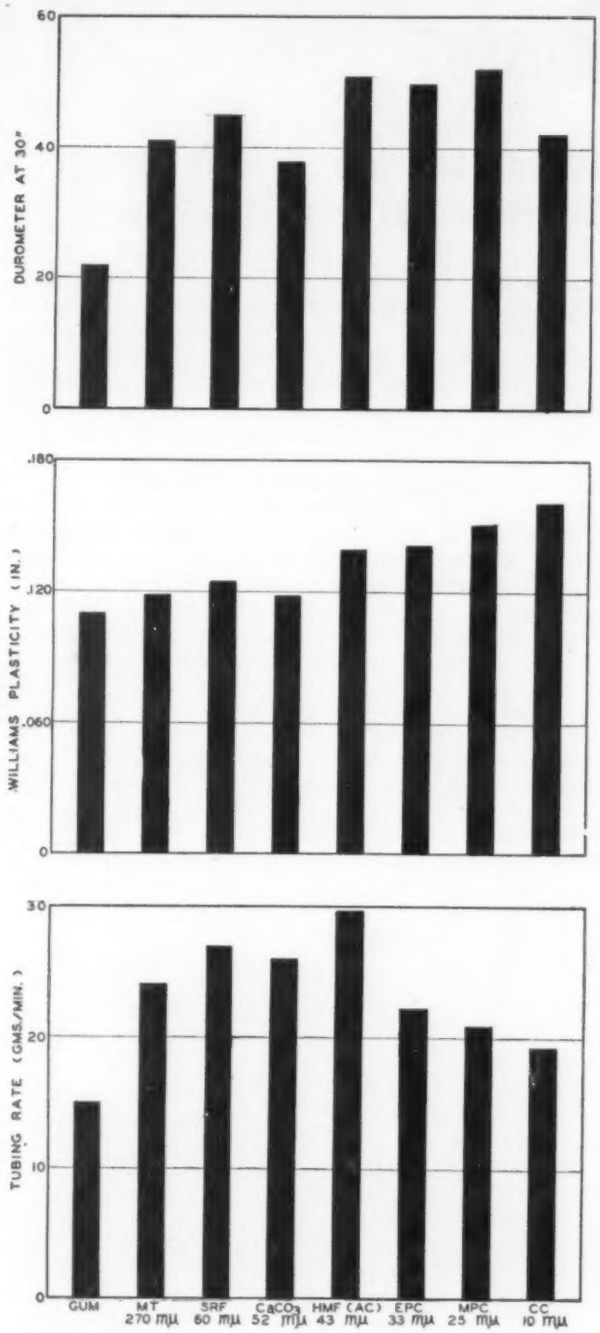


FIG. 6—Durometer, Plasticity and Tubing (No. ½ Royle Tuber, 3/16" die, 24 r.p.m., 170°F.).

The pigments listed in Table I were milled in the following formula and cured at 307°F:

GR-I	100.	100.
Zinc oxide	5.	5.
Stearite A	1.	1.
Sulfur	2.	2.
Tetramethylthiuram disulfide	1.	1.
Mercaptobenzothiazole	0.5	0.5
Carbon black	50.*	
Witcarb R		78.*

* 25.6 volumes.

Physical properties at optimum cures of the resulting stocks and also of the base compound containing no pigment (gum stock) are plotted in Figs. 4, 5 and 6. The particle size of each pigment is indicated at the bottom of the bar graphs.

In general, decreasing particle size appears to give rise to increased modulus, tensile, tear, heat build-up, durometer, and plasticity. Rebound decreases while elongation and tubing are erratic, the latter appearing to reach a maximum in the range of 40-80 mμ.

Particle Size Trends

Due to the superimposing of surface and crystal structure factors, the trends with particle size are not nearly so regular as in the case of a series of channel blacks. Thus acetylene black tends to form a more rigid gel-like structure than other pigments of similar size. As a result the acetylene black stocks have higher modulus and durometer, and lower elongation and rebound than would be expected on the basis of their particle size.

Likewise, Witcarb R and R-40 have lower tear, modulus, durometer, and tensile, lower heat build-up and higher rebound than indicated by particle size. This behavior is probably associated with surface factors (nature of surface in the case of Witcarb R and extent of surface in case of R-40) which result in difficulty in dispersing these pigments. With the normal mill procedures used in this series of tests, appreciable numbers of agglomerates may be present in the stocks containing R-40 and Witcarb R. As a result, the effective size of these pigments may not be as small as the average size of the ultimate particles.

Summary

The behavior of one inorganic and six black pigments in GR-I has been determined. Properties of the resulting stocks depend on crystal and surface structure of the pigments as well as on their particle size. Despite large variations in both crystal and surface structure, fairly distinct trends with particle size can still be observed for some properties of the GR-I stocks.

ACKNOWLEDGMENT

The authors wish to express their gratitude to other members of the Continental Carbon Co. staff who assisted in obtaining the data and preparing the graphs; to Dr. P. L. Copeland, of the Illinois Institute of Technology, who took the electron microscope pictures of Continental D and Continex SRF; and to Dr. Willig, of the Armour Research Foundation, who took the X-ray photographs used in determining the crystal structure factors.

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New Injection Molding Processes

Chrysler Corporation Develops Continuous Injection Molding and Extruding Machine and Lester-Phoenix Introduces New Type Press

INJECTION molding of plastics has long been a successful accomplishment while injection molding of rubber has long been under experimentation. It is now apparent from recent announcements that the process has passed the experimentation stage where rubber is concerned and machinery is available for commercial use. The Chrysler Corporation, of Detroit, Mich., has announced the development of a continuous injection molding and extruding machine for rubber and plastics, and Lester-Phoenix, Inc., of Cleveland, Ohio, has introduced a new high pressure injection press which accomplishes three separate and distinct molding processes, *i.e.*, injection molding of thermoplastic materials, jet molding of thermo-setting materials, and transfer molding of electronically heated, preformed materials. Each of these machines will be described in turn.

Chrysler Continuous Injection Machine

The Chrysler-developed continuous injection molding and extruding machine, one of which is already being used in the production of seamless plastic tubes to launch rockets and another for the mass production of rubber insulators, employs a worm screw similar to those found in coal furnace stokers. It has produced as large an item as a plastic battery case in less than five minutes, using 128 ounces of thermosetting plastics, as well as 144 rubber insulators at one molding in less than three minutes. It is capable, according to Chrysler engineers, of producing multitudinous precision rubber parts.

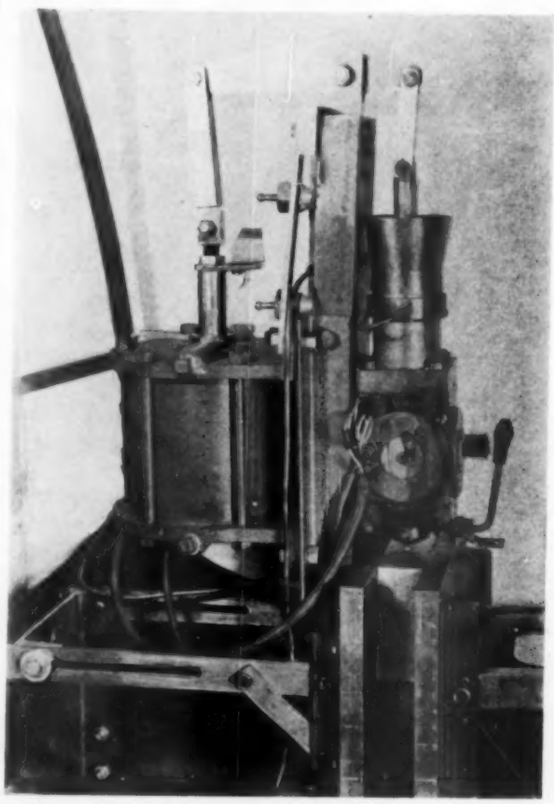
In the tubing field the machine has enormous possibilities. Thermosetting plastic tubes, made in any lengths desired, can be used for overhead and underground pipelines. The thermosetting plastic is highly resistant to corrosion, and in some cases can replace steel and iron pipes with lesser resistant qualities. Where long lengths of iron, steel or concrete are necessary for rigidity, thermosetting liners produced by the machine would provide resistance to corrosion.

Eventually, Chrysler engineers believe, the new machine may displace the old type compression method of molding plastics and rubber, as well as the newer injection, or plunger type. Under the compression molding method, plastics or rubbers are placed in a die by hand and pressed into shape by clamping another die to it. To insure adequate material in the finished product more than enough plastics or rubbers are inserted in the die cavities. Under pressure the excess materials force themselves out through cracks where the die faces join, causing flash, or waste material, which must be trimmed at a loss of material and time.

With the continuous injection machine only the quantities of plastics or rubbers needed are injected into dies already clamped together, eliminating flash and saving time and materials and cutting costs of production. The ordinary "one shot" injection machine, which was an advancement over the compression type, eliminates flash waste, but is limited in the size of parts it can produce. With the new Chrysler-developed machine producers are able to inject plastics or rubbers in a continuous stream as long as there is mold area to be filled. Different dies for different sizes of products can be used with the same continuous injection head.

The continuous injector consists of a simple hopper holding plastics or rubber. The materials are fed to a heating cylinder, where a special churning apparatus keeps them evenly mixed. The putty-like substances are then shot under screw pressures up to 22,000 pounds per square inch through a nozzle clamped to an opening where the die plates join. When the plastics, or rubbers, have filled every tiny crevice in the mold, or series of molds, the back-pressure automatically shuts off the feeder.

Because of the uniform feed, and even mixture of materials, the curing time required by the new machine,



This is the original injection molding machine made by Cousino on which the new Chrysler continuous molding and extruding machine is based.

as compared to similar materials and other types of machines, has been cut by approximately 93 per cent, besides the complete elimination of waste. Where multiple molds are used the tiny canals through which the putty-like materials pass from one cavity to another produce excess webbing which is easily trimmed away without impairing the finished products.

The die clamping capacity of the machine has already been tested at 450 tons, but the screw feed will fill any mold held at any pressures beyond that figure. When the machine automatically shuts off the flow of plastics or rubbers the worm screw reverses itself, keeping the materials remaining in the heating and feeding chambers pliable and ready for the next injection.

Although it is capable of making plastic and rubber parts larger and faster than two other types of machines, the Chrysler-developed machine weighs but 6,000 pounds, or one-twelfth as much as one of the other types, and is approximately one-third as large.

The machine was developed by degrees from an original apparatus conceived and built by Walter P. Cousino, a 45-year-old native of Michigan. Employed for 20 years by the Chrysler Corporation, Cousino is now a project engineer. Five years ago Cousino needed a machine which would quickly produce plastic gadgets and rubber tires for midget racing automobiles, so he built a plunger-type apparatus in the basement of his home. Operating like an automobile piston, the plunger he conceived forced plastic into molds, producing crank handles for adding machines, and even fish and animal eyes for the taxidermist trade. A second plunger was added to give the machine a more continuous flow, and later the worm gear replaced the plungers. Three years ago the Chrysler engineering facilities were placed behind the machine and the present worm-screw, continuous-fed type is the result.

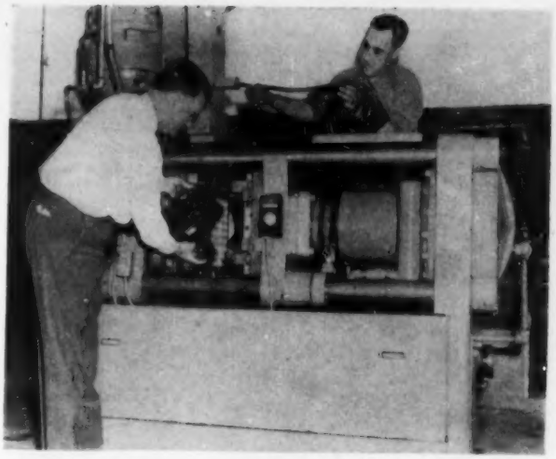
The Chrysler Corporation does not plan to manufacture the new type continuous injection molding and extruding machine. The Monroe Auto Equipment Co., Monroe, Mich., is producing rubber and plastics parts on one of the new machines and has also been licensed to manufacture them. The Hydraulic Press Manufacturing Co., Mt. Gilead, Ohio, has also been licensed to manufacture the new machine, which is fully covered by patents.

Lester-Phoenix Injection Press

The new high pressure hydraulic injection press introduced by Lester-Phoenix, Inc., known as Model 3V-12, was designed for that company by the Lester Engineering Co. and is described as the first machine of its kind ever built in America. As previously stated, it performs three separate and distinct molding processes, and all three processes may be carried out with no loss of time in converting from one to the other. Ordinary compression molding can also be done if desired, while the operation of the press can be automatic, semi-automatic or manual.

The new press is constructed in a vertical design for a number of reasons. For jet molding, as an example, the vertical construction makes it possible to drop the material into the injection cylinder by gravity, thus feeding it more completely and uniformly. Since the plunger in the vertical machine works vertically, much wear and tear on the injection cylinder is prevented, and each charge can be a complete one, filling the entire cylinder.

In discussing the functions of the new press, little need be said here about the injection molding of thermoplastic materials which is carried out in the same manner as in the standard machines featured by the company, with a vertical injection cylinder using a hollow injection plunger. However, when using this design in a vertical press, the usual right angle bend for delivery of the plastic material into the vertical die is unnecessary.



The "mat" of rubber insulators being removed from this Chrysler continuous machine at the Monroe plant was produced in 3 minutes.

Regarding jet and transfer molding of thermosetting materials, both are much faster and more efficient than conventional compression molding, and a choice between them is dictated primarily by the size and weight of the casting involved. Generally speaking, the jet process has been used mostly in the production of castings up to 12 ounces, while the transfer process has been more extensively used for larger castings, although any such limits are arbitrary and by no means final. These facts evidence the necessity for and utility of a molding press which will combine both types of thermosetting molding.

In usual compression molding, inserts may be displaced by the flow of material as the die closes. Dies may be injured in this manner. In both jet and transfer molding, the die is closed first and then the plasticized material is injected about the rigidly held inserts.

In transfer molding, the material used may be in the form of pills, discs or other preforms. The Lester machine will handle any of these but is designed particularly for the use of preformed circular discs, which, after pre-heating, are placed in a vertical injection cylinder and then driven by hydraulic plunger through runners into the die cavities.

A suggested method of handling preforms may be to have them stacked in a vertical column above a turret consisting of polystyrene wheels (selected because it is unaffected by electronic current). As the turret revolves it picks off a disc and places it between the electrostatic plates of a high frequency generator. Alternating current ranging from 12 to 30 million cycles per second, obtained from tubes similar to the power tubes of a radio station, passes between these plates, bringing the disc up to a molding temperature in a matter of seconds.

The heat results from the effort of molecules of the plastic preform to adjust themselves to alternating positive and negative high frequency charges; every par-

Here is a close-up of the mold used in the Chrysler continuous machine with the operator removing rubber insulators from one face of the mold.

ticle of the disc will be of the same temperature at any given time, provided the material is uniform in composition and density. The amount of heat energy required in KW is determined by the dielectric constant and the power factor of the material.

After the material has reached a temperature just short of its curing or setting temperature and has become plastic, a turret can carry the heated disc to the opening of the vertical injection cylinder; several charges may thus be placed in the cylinder preparatory to injection. Then the hydraulically actuated plunger injects the plasticized disc into the die. Heat is applied by resistance heaters within and about the die to accomplish the final curing or setting up of the castings in a fraction of the time required in conventional compression molding.

As the die opens, a bumper bar ejects the casting, along wtih the runners and possibly a thin injection-cylinder disc or slug. The entire process consumes from 1/3 to 1/5 the time required for compression molding, depending upon section thickness in the casting. A better casting is obtained because the material is uniformly heated throughout, not depending upon surface or contact heating, which may tend to cure at the surface and limit heat flow into and cure of the interior of the die casting.

In addition to the considerable reduction in curing time, this method of heating and molding results in lower acetone extractable, lower stress upon the mold, elimination of stresses within the casting, and therefore elimination of cracking and warping. It also enhances the possibility of molding sections whose thickness has in the past ruled them out for reasons of economy, because the easy flow of material makes possible thinner and deeper wall sections.

In general, transfer molding broadens the field of plastic molding because it renders feasible many jobs which in the past were given up as too large, complicated, or difficult. Where structural strength is required in heavy castings, it may be possible through the use of transfer molding with more uniform curing to use a cheaper material of lower impact value and still obtain castings of high quality.

Jet molding of thermosetting material is accomplished on the Lester Model 3V-12 machine by the patented jet molding process of introducing granular material into a heating cylinder where it is first plasticized by resistance heaters, as is usual in the molding of thermoplastic materials. Then at the moment of injection, the plasticized material is forced through a short small-diameter nozzle which is heated to high temperature by low voltage, high-amperage current in such a manner that the material injected into the die cavities is just below the curing or setting temperature. Heat from resistance type heaters, placed within and about the die, is applied to accomplish the final curing or setting.

In order to prevent setting up of the material in the injection nozzle, water flows continuously through the two heating electrodes thereon, so that the material is chilled below the curing or setting point, immediately after the heating current has ceased to flow. The current used is similar to that used in a welding machine, and similar transformer and electric timing control equipment is used.

The jet molding process is also applicable to the injection molding of either soft or hard rubber articles. This method obviously cuts heating time as compared with ordinary compression molding, since the material is virtually up to curing temperature upon its introduction into the die. Here again, the time consumed is from 1/3 to 1/5 that required for compression molding, depending upon thickness and weight of sections. A license for the use of the jet molding system embodied in this machine must be obtained from Plastic Processes, Inc., of Cleveland, Ohio.

The Lester-Phoenix Model 3V-12 machine which accomplishes three separate and distinct molding processes.

Setting-Up Test For Compounded Rubber

By F. B. MENADUE

THE importance of man-hours and power makes the use of ultra accelerators desirable, but at the same time the critical shortage of rubber makes waste from setting up or scorching, either in bin storage or in processing, most undesirable. Not only is there the directly evident loss, but often rubbers are only partly "set up" on bin storage, and although "brought back" in the warming up process, or their condition masked by admixture with freshly mixed rubber, there is a loss of physical strength, and variability in subsequent processing, with its disagreeable features of waste and delay.

The present day value of "setting up" or scorchability tests is thus evident. Furthermore, the increased use of reclaim with its varying alkalinity in the case of the alkali process, or in vulcanizing agents with the oil process, and the doubtful consistency in properties of synthetic rubbers, clearly emphasize the need.

Tests previously described use the plastometer *(1)* and sheeting from a mill *(2)* for determining the setting up or scorch. The following method has been designed for sensitivity, simplicity in preparation of the test piece to be used for both routine tests and research and, of particular value, to enable a definite figure of measurement to be quoted.

The piece of rubber taken from the mill batch—about ¼" thick by 3" long and 1" wide—is heated in water for a set time and temperature. Test strips 5/32" x 2½" x the original thickness, are cut from it exposing smooth, flat, "internal" surfaces. These are bent over a metal plate 1/16" thick with the internal cut surfaces at right angle to the bending plane and thus in contact with the plate surfaces; then heated for 2 minutes at 210° F.; then one arm released and the amount of its recovery at 2 seconds and 60 seconds noted.

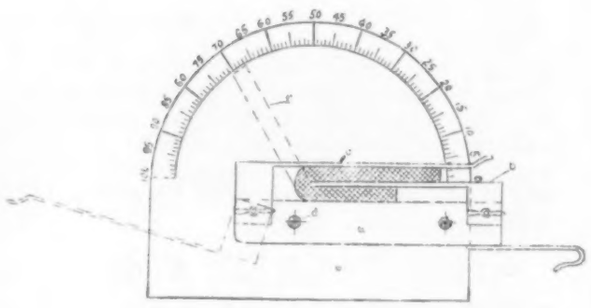


FIG. 1.

TABLE I

Formula	212°F. (Mins.)	Percentage Recovery at 2 secs. (%)	60 secs. (%)
a	nil	nil	nil
	10	nil	nil
	30	66	77
	45	70	83
	60	94	100
	160	94	100
b	nil	nil	nil
	10	nil	nil
	30	nil	nil
	60	15	34
	90	29	55
	160	45	84

In the illustration—Fig. 1—(a) is the base made of wood or grooved aluminum, ½" wide; (b) is one two-shouldered hinged plate to hold down one arm of the test piece, and (c) another one to hold the other arm. Thumb screws hold the plates tight. The whole is heated in water for 2 minutes at 210-212°, then placed in position over the graduated arc scale (e) using the pins and slot (d) as guides. The scale base is in a tray of water at 210°, as otherwise the test piece cools rapidly. The plate (c) is rapidly swung back as shown by spaced lines, and the position of the freed arm noted. For routine control, the water tray may be dispensed with, the reading at 2 seconds being sufficient; or, to obtain the 60 sec. reading beyond which it is found no further recovery takes place, the holder with the one arm of the test piece free to move may be immersed in the water for the 60 seconds and taken out and read as above. (f) is the freed arm of the test piece, showing recovery of 67 on the scale.

As some rubbers behave differently in wet heat as against dry heat, and as "setting up" or scorching concerns only dry heat conditions, the original mill sample piece is protected at the point of bending during the "scorching" treatment in water; or clamped in a light frame between thin metal plates.

The *percentage recovery* is obtained by basing the reading obtained as above on that obtained from a sample cured to its optimum cure in a press. This latter is referred to as the *maximum recovery figure* for the rubber concerned under the above test conditions. Thus the diagram shows a result:—1 hr. 212°F./2 sec. = *percentage recovery* of 73.6 from a *recovery reading* of 67 on a rubber which had *a maximum recovery figure* of 91 at 2 seconds, cured at the optimum cure of 10 minutes at 70 lbs.

Table I shows the effect of different scorching treatment with two different types of formula, and the percentage recovery at different times of release. The formulas used were:

	A	B
Rubber	100.	100.
Zinc Oxide	10.	5.
Whiting	120.	40.
Clay	—	40.
Stearic Acid	2.	0.5
Oil	5.	—
Sulfur	1.5	2.75
Magnesium Oxide	—	2.
Captax	1.5	—
D.O.T.G.	0.25	—
D.P.G.	—	0.5

Maximum recovery figures were 90 at 60 secs., and 88 at 2 secs. in the case of (*a*), and 93 and 91 for (*b*). Press cure for (*a*) was 6 min. at 70 lbs. and for (*b*) 10 min. at 70 lbs. steam, in press.

The figures show the wide range of scorchability. It will be seen the reading at 2 seconds increases the range and sensitivity duly providing for the factor of "rate of recovery." This period is recommended for general control work.

The boiling temperature for "scorching" of 1 hour at 212°F. is high for tests on "bin storage" setting up in some cases, and modification can be made as required. For determination of the actual amount of setting up occurring in the bins, no preliminary boiling or heat scorching will be done.

It will be obvious that before coming to a conclusion as to the "processing," setting up or scorch properties of a rubber mix, the plasticity must be duly considered in conjunction with the percentage recovery, or, more exact, the heat producible by friction and degree of conductivity.

Accuracy in measurements, and particularly the time and temperature in the setting operation of the bent test piece—2 minutes, is essential. Recovery reduces as the heating time of this operation increases.

LITERATURE CITED

(1) J. V. Weaver, *Rubber Age (N. Y.)*, Nov., 1940.
(2) *Vanderbilt News*, Vol. 8, No. 5, Oct., 1938.

Vultac—A New Series of Vulcanizing Agents

A NEW series of alkyl phenol sulfides, representing a new class of active primary vulcanizing agents for the butadiene rubbers, is currently being offered under the trade name of "Vultac" by Sharples Chemicals, Inc., 123 So. Broad St., Philadelphia 9, Penna. Three modifications, based on *p*-tert-amylphenol, are offered, known as Vultac No. 1, No. 2 and No. 3, respectively. All three differ in sulfur content to meet the varying requirements of the industry.

The Vultacs are soft brown resins, with sulfur content ranging from 13 to 28%, softening point from 45-55° to 70-80° C., and specific gravity from 1.11-1.12 to 1.19-1.20. They can be handled like other viscous plasticizers or low melting solids and no special precautions are necessary except that it is advantageous to warm them before adding them to the stock on the mill rolls. When added in the early mixing stages, they serve as processing aids, reducing the nerve of the rubber and giving a pliant, smooth-milling stock, at the same time improving the dispersion of fillers and pigments. Because the Vultacs are readily soluble in GR-S and Buna N and during cure release active sulfur uniformly throughout the rubber, the resulting vulcanizates have improved resistance to flex crack growth and tear, as well as retention of tensile, elongation, and lessening of "marching modulus" upon aging.

The Vultacs also function as effective tackifiers for GR-S. Since Vultac No. 1, a mono-sulfide, is a milder vulcanizing agent than Nos. 2 or 3, disulfides, its use is recommended by Sharples Chemicals for those applications requiring larger proportions to obtain maximum tack. The degree of tack which can be realized with the disulfides is limited by the quantity which can be tolerated as vulcanizing agents, and these materials, therefore, may be used to greatest advantage as total replacements for sulfur, functioning in a dual manner as both primary vulcanizing agents and as tackifiers. Stocks compounded with Vultac can be used safely under normal processing conditions without scorching although they do show a higher initial cure than similar stocks containing sulfur.

According to the manufacturers, Vultac No. 1 is best employed in 10 to 25 parts per 100 parts of GR-S while at the same time decreasing the sulfur content approximately one-half that ordinarily used. Vultac No. 2 is recommended particularly for GR-S stocks when used as a total replacement for sulfur in 5 to 10 parts per 100 parts of GR-S. Vultac No. 3 also serves as a total replacement for sulfur when used in 5 to 6 parts per 100 parts of polymer, and this type Vultac is especially recommended for Buna N stocks.

Auxiliary softeners and plasticizers may be used advantageously with the Vultacs to enhance the tack obtained with these products when used in GR-S stocks. However, certain softeners, particularly of the resinous type, such as pine tar, turpentine and rosin, tend to retard the vulcanization of stocks compounded in this manner. This retardation may be offset by the proper adjustment of the acceleration used.

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We are pleased to announce that we have received a new shipment of Vols. IV (1940), V (1941) and VI (1942) of the ANNUAL REPORT ON THE PROGRESS OF RUBBER TECHNOLOGY. These "Reports," issued by the Institution of the Rubber Industry (England), cover world-wide developments annually in all branches of the rubber industry. Vols. IV and V sell at $3.00 each; Vol. VI at $3.50. Address orders to

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Rubber from a Hardy Tree

By E. E. NAYLOR
Technical Assistant,
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New York, N. Y.

THE verdict still stands against possible exploitation of the ornamental *Eucommia ulmoides*, which has been designated as "the only hardy rubber tree," because its 3% of rubber content is considered too insignificant for commercial extraction. Still, a fairly abundant supply of elastic substance exists in nearly all parts of the plant. If a piece of the bark, a fruit, or a leaf is broken and pulled apart, numerous fine strands with a silvery luster appear, and they will stretch about a centimeter before they snap in two. In the leaf these threads always appear from the broken ends of the veins, for they are definitely associated with the branching vascular system. The wood, or xylem, and the embryo inside the dry fruit are the only parts of the plant free of this material.

The yield is about 3% of the dry bark weight and slightly over 2% of the dry leaf weight. Reports from the Royal Botanic Gardens at Kew in 1921 stated that the quality of the rubber contained was excellent but that the yield was considered too low to make eucommia one of the important rubber-producing plants.

Note: This article is reproduced from the January, 1944, issue of the "Journal of the New York Botanical Garden."

View of the leaf of the Eucommia ulmoides, native of China, where it is known as Tu Chung.

Close-up of the Eucommia ulmoides leaf, showing the strands of rubber.

The elastic constituent exists in a dry, solid condition in the living plant. This peculiarity is shared with *Parthenium argentatum*, source of guayule rubber, and with *Chrysothamnus graveolens*, the rabbit-brush of the Southwest, another plant which has been considered as an emergency rubber-producer. Because of this, the elastic threads can be observed in the dry bark of the tree or in the old dead leaves picked off the ground during midwinter.

A chloroform extract made from the ground leaves has a dull brown color with slight metallic reflections. When it is poured into boiling water, a soft black material is deposited on the surface. Rolled into a ball while hot, this substance is quite elastic, but it tends to harden as it cools, apparently losing most of its elastic properties. It is free from stickiness. When ignited it produces a heavy black smoke and the characteristic odor of burning rubber.

It is evident from the dry condition of the rubber that it can not be obtained by any tapping process. Extraction from ground portions of the plant with chemical reagents is the only method thus far described. Obtaining rubber from such a tree as eucommia would, therefore, necessitate some method of annual pruning or of stripping off portions of the bark, unless the trees themselves were to be sacrificed. It has been said that the leaves, with only 2%, would probably not supply sufficient quantities of rubber to be of commercial usefulness, yet, if the tree were to be exploited, the annual crop of leaves might in the end prove to be the most practical method for obtaining rubber.

The carrier cells in *Eucommia* differ considerably

from those in such plants as *Hevea* or *Manihot*. In these true latex-bearing plants the system constitutes one complicated network arising from the branching and anastomosing of cells originally present in the embryo. When the system is broken at any point, as by tapping, the contents flow out for a time. The thin-walled cells bearing the solid rubber in eucommia do not branch or unite, nor are they present in the embryo. They originate from a parenchyma of the vascular system and elongate rapidly as the elements of the vascular system differentiate. At maturity each cell is extremely elongated and uniformly filled with this homogeneous elastic substance. In a leaf which has been made almost transparent with bleaching reagents, these groups of rod-like cells are very conspicuous as they follow the branching veins. The rubber is also present throughout the leaf in small globular masses generally distributed within the parenchyma of the mesophyll without any reference to the veins.

Eucommia can be easily grown from seed. Apparently there is no dormant period, for seeds gathered here at the Garden germinated within three to five days after they were removed from the dry fruit and placed on moist blotting paper. According to the Royal Botanic Gardens' report, the seedlings grow well on a variety of average-quality soils. A group of Kew seedlings reached a height of 15 feet after 10 years. The tree may be propagated by cuttings taken in midsummer from the current year's growth and rooted after a few weeks in moist sand. Plants grown from cuttings need pruning and training for the first few years to prevent them from becoming bushy and spreading. Layering is also a possible means of propagation.

Though still rare in cultivation, the tree appears to be perfectly hardy in this vicinity, and will grow as far north as the Arnold Arboretum in Massachusetts. Two healthy specimens have been growing since 1912 on the grounds of the New York Botanical Garden, and at the present time they are about 25 feet high.

Close-up of seeds of Eucommia ulmoides, with the rubber strands again plainly visible.

A native of China, where it is called "Tu Chung," *Eucommia ulmoides* is similar to our common elm in appearance and habit of growth. The Chinese hold it in high esteem as a drug and general tonic, although its actual therapeutic value is doubtful. Experiments with the bark have resulted in the extraction of only 0.038% of alkaloids. In the mountainous regions of central and western China the tree is cultivated in small plantations and the bark is sent to large cities for local use or for export.

Taxonomically, this tree occupies a somewhat isolated position. It is the only member of the genus *Eucommia* (established by Oliver in 1890), and *Eucommia* is the only genus in the family Eucommiaceae. It is rather closely related to the witch-hazel, though in appearance, as its specific name indicates, it somewhat resembles the elm.

Apparatus for Determining Relative Porosities of Materials

A PATENT for an interesting apparatus which can determine the relative porosities of materials has recently been issued to Stuart H. Hahn and Robert H. Judson and assigned to the B. F. Goodrich Co., Akron. The porosity is tested by the degree of vacuum in a chamber which is an important part of the apparatus. Chief object of the invention is to provide the mechanism for determining the relative porosities of various materials by drawing air or gases through the material and indicating the rate of flow. The apparatus was originally designed for testing the porosity of various types of sponge rubber, but it has many other applications, the company believes.

So small and compact that it can be easily lifted and transported with one hand, the apparatus consists of a vacuum chamber placed in contact with the material to be tested, a constant speed power driven fan for evacuating air from the vacuum chamber, an outlet port for emitting the air, a pressure gauge to measure the degree of partial vacuum in the chamber and indicating this on a fixed scale. An arm connected with the manually operated switch which starts and stops the fan forces and holds the measuring indicator in position when the switch is turned off.

The scale used with the apparatus is adhered to a piece of translucent plastic and is reproduced on a transparent piece of photographic film, with a lamp placed behind the printed scale so that the degree of porosity can be easily read. With highly porous material, the vacuum created by operation of the apparatus will be slight, and this vacuum increases as the porosity decreases. The scale used with the apparatus may be graduated in absolute units or have no units and be made to show the relative porosities of two or more pieces of material.

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Better Management for the Rubber Factory

XI—POSTWAR RESERVES

By ARTHUR ROBERTS

AFTER they sound the last "all clear," manufacturers will be ready to "spring" many new developments in business equipment, some of them revolutionary in design or application, new machines, fixtures, store fronts, even new type buildings and appurtenances thereto, all designed to facilitate the production, storage and distribution of consumer goods at an accelerated tempo in the postwar period. To keep "in the swim", rubber goods manufacturers must modernize or go down with the tide against more aggressive competitors who make such investments after the war. Now is the time to plan your postwar program of modernization, expansion and promotion, not when the war is over. What steps are you taking to be ready when the great day comes?

Coverage of Postwar Reserves

Some managements are thinking about postwar possibilities, some have rather nebulous plans, but few have adopted a fiscal program to cover the purchase of new equipment, business promotion and expansion in the postwar period. One is useless without the other. The financial ability to swing a program of postwar rehabilitation is important, the goal achieved by setting up postwar reserves now. Such action will also aid the survival and encouragement of free enterprise and maximum employment. Postwar reserves are being set up to cover:

1. Inventory losses: Due to price declines at war's end and the disposal of unadaptable, obsolete or excessive war materials, the conversion and salvage of obsolete, deteriorated or otherwise useless non-war materials, frozen during the war.

2. Reconversion costs: What it costs to re-organize and get going on peacetime production again. Incidentally, reconversion during the postwar period may cost more than the expense of conversion to war production.

3. Forced obsolescence: To cover equipment not written off the books, but old before its time, because improved equipment born of the war is marketed after the war.

4. A decrease in plant value due to the reduction in capacity resulting from a drop in volume after the war.

5. Separation allowances or bonuses paid to employes who are discharged at the termination of the war.

6. Repairs and maintenance deferred because of all-out production or the inability to get adequate repair service in wartime. Deferred repairs are always more costly than repairs made immediately.

7. Accelerated depreciation: Equipment being worked long hours depreciates at a higher rate than equipment under normal operation. If rates were set before the production overload, the write-off should be more during the war years. But, in many cases, this excess isn't computable until after the war. A postwar reserve is the adjusting factor.

8. Forced sales of equipment bought for war production that may not be of use after the war.

9. The amortization of war expansion not entirely absorbed at war's end.

10. The possibility of loss due to negotiation.

11. A decrease in plant value due to the reduction in capacity resulting from a drop in volume after the war.

12. Loss on accounts receivable: Credit is based largely on income, hence, many employed at war work are being given credit today. If the income of these debtors is cut or stopped at war's end, the creditors may suffer heavy losses, which will be felt directly or indirectly by all credit-granters, from manufacturers to retailers. If directly or indirectly your wares are being sold to consumers on credit, your losses from this source may be higher after the war and it is wise to "cushion" this hazard now with a postwar reserve.

Setting Up Necessary Credits

Sound accounting demands that current revenue be charged with all reasonably determinable costs and losses fairly applicable thereto. Wartime losses, costs and contingencies should be charged to the war period via the postwar reserve. Likewise the cost of postwar rehabilitation and general business operation.

Where to get the credits for such reserves? Out of

392 concerns queried anent postwar reserves, 255 charged current income, 21 charged net worth, 20 transferred credits from othed reserves, 15 continued credits to reserves for equipment written off during the war but continued in operation because replacements were not available, and 81 reported no experience. So you see the practice recommended in this article is prevalent and worth your consideration too.

Some businessmen may crow over the fact that they are earning more today than in prewar days, taxes considered, but this may be due to lower commercial overhead, because selling, advertising and collection expense has been reduced, because old equipment that would normally be replaced has been written off during the war and depreciation expense removed from cost, because overhead per sales dollar is abnormally low for those working full capacity. If you are in that boat, reserves for postwar operation will correct your vision by bringing current profit into the normal zone.

Costs Must Include Adequate Charges

Reserves do not represent actual cash, some will contend, so we may set aside reserves for postwar operations but not have the money to finance them. True. Reserves are not necessarily cash. However, if properly handled, they should increase your bankroll. Their purpose is to provide recordings to substantiate tax deductions for depreciation and to see that your costs include adequate charges for wear, tear and obsolescence.

You may have $50,000 in reserves on your books at war's end and not a nickle in cash, but that is a matter of bad management rather than a weakness in the practice of reserve accounting. Our purpose in this article is not to tell you how to keep working capital in a liquid state but to set you straight on postwar reserves so that you handle this essential properly at this time when it is so vitally important.

Tax laws permit deductions only in connection with reserves for depreciation and bad debts. You can't take deductions for postwar reserves but Congress may authorize such credits so that it is advisable to begin such recordings now because they may help you justify a worthwhile tax saving. Then, too, many concerns use reserves to keep the value of their net worth at a conservative figure these days even though the tax laws do not consider them in calculating the tax liability. One organization has issued a balance sheet showing a postwar reserve of $500,000 to cover a possible loss in inventory after the war.

Every progressive management should plan for postwar activity now, including an estimate of the outlay for referred war costs, postwar modernization, expansion and promotion, and take steps to set up reserves for the cost. You may "guestimate" wrong, but some sort of a plan is better than wondering what it's all about when the Axis cries quits.

Peacetime production will come back only gradually. For a time, demand for new equipment will exceed supply. Those who have written off equipment or over-worked equipment not written off, may not be able to get replacements the day the armistice is signed, but those who will be served first will be those who can put their money on the line, and postwar reserves will help you get this priority, giving you a big advantage over competition, because you will be among the first in a virgin field to utilize the latest developments in postwar production, warehousing and distribution equipment, and foremost to carry the story of new and better rubber products to the consumer.

Some contend that high taxes make it difficult to set up postwar reserves. However, high or low taxes, the creation of these "cushions" is good business and should be part of postwar planning. Wise managements everywhere are postwar-planning and, as we said before, the plan without the fiscal counterpart, even if only on paper, is only half the job. The rubber products manufacturer who establishes postwar reserves is in the right groove with other businessmen of vision who are up against the same high tax rate, yet, who are establishing such credits.

It is no more logical to forego postwar reserves today because taxes are high than to eliminate reserves for depreciation. Because of the high tax rate, it is possible that a rubber goods manufacturer may not be able to replace existing equipment when written off or after the war for lack of funds but this is no reason why he should discontinue the ordinary depreciation reserve.

Some small businessmen feel that the government may step in and lend them money for postwar operations. From 1933 to 1942, Congress considered 390 bills in behalf of small business but few businessmen have experienced tangible results from this tremendous legislative effort. War industries may get loans from the government for reconversion but those turning out civilian production had better dig up their own do-re-mi by means of postwar reserves.

If postwar reserves help swell my liquid funds now, why not freeze this portion of my cash, you may ask? Okeh. Open an account for the desired sum, call it "Fund for postwar promotion," and invest this money in war bonds until needed.

New Method of Surface Inspection

FAXFILM is the name given to a new, quick method of inspecting surface finishes which provides comparison with specified standards, immediate surface inspection, and a permanent record, if desired. The method may be applied to metal, wood, paper, fabrics, crystals and other products.

Developed by Rex D. McDill, 5109 Mayfield Road, Cleveland, Ohio, Faxfilm reproduces surface finishes in the third dimension for instant comparison with standards for roughness, waviness and lay, and for checking surfaces for cleavage, porosity, dents, scratches, etc., by means of projection on any ordinary projector. Enlarged 10,000 times, or 100 diameters, Faxfilm is said to be distinct and to show details of the finest irregularities up to .0001-inch.

The operation of Faxfilm is simple. One side of a piece of clear plastic film is softened by use of a small amount of solvent so that when it is pressed onto any surface it penetrates every irregularity. The piece of film is then mounted in a 2-inch square frame which can be labeled and identified in any manner. This frame can be used in any type of projector and can be enlarged to 100 diameters or more.

According to its manufacturer, Faxfilm is indestructible by heat of the projector in which it is used and is resistant to acids and alkalies. It is non-inflammable.

Editorials . . . . . .

Postwar Cost of Synthetic Rubber

MILITARY events are shaping up favorably so rapidly that the day is drawing closer when some definite decision will have to be made on world production and distribution of rubber, both natural and synthetic. A start in this direction was recently made in London when a meeting was held by American, British and Dutch representatives to formulate a preliminary program and to launch an investigation to determine potential production and consumption requirements in the postwar period. The role to be played by America in any rubber regulation of the future, due to its creation of synthetic rubber facilities with a total output which nearly matches prewar crude rubber output, has repeatedly been emphasized.

The two major factors which will govern any future rubber regulation wil be availability and cost, with the one tied in closely to the other. In this connection the special report of the Office of the Rubber Director, just prior to its liquidation as an autonomous government agency, devoted to plant investment and production costs of the synthetic rubber program, prepared by Dr. E. R. Gilliland and H. M. Lavender, Jr., is of special interest. It reveals the full scope of that program and is crammed full of pertinent data relative to rated capacities, total production to date, ultimate capacity, estimated investment cost by plant, source of funds, and other information.

The report shows that the 17 government-owned butadiene plants have a rated capacity of 626,000 tons per year, produced 425,360 tons through June, 1944, represent a total investment of $346,633,296, and that investment cost per annual ton of estimated actual ultimate capacity will be $398.00. The 5 government-owned styrene plants have a rated capacity of 188,500 tons per year, produced 121,790 tons through June, 1944, represent a total investment of $82,750,000, and investment cost per annual ton of estimated actual ultimate capacity will be $285.00. Investment per annual ton of estimated actual ultimate capacity for GR-S is set at $663.00, for Neoprene GN at $717.00, and for Butyl at $779.00. The average cost of all synthetic rubbers in the government program is estimated to represent an investment of $675.00 per long ton on the basis of estimated actual capacity, or slightly more than 30 cents per pound.

Current operating costs, excluding feedstocks, amortization, preliminary expense and research, are listed as 2.21 cents per pound for butadiene from alcohol and 4.63 from butylene (dehydrogenation), 2.52 cents for styrene, and 4.83 cents for the copolymer. Postwar costs are estimated at 2.19 and 4.48 cents for butadiene, 2.51 cents for styrene, and 4.44 cents for the copolymer. Current operating costs including feedstocks, but excluding amortization, preliminary expense and research, are shown at 24.04 cents per pound for Neoprene GN and 21.51 cents for Butyl. Postwar operating cost for Neoprene GN is estimated at 19.58 cents per pound.

Based on the various costs and cost factors discussed, the report contains the statement that GR-S can now be produced at an out-of-pocket cost of 12.2 cents per pound, with styrene and butadiene at 7 and 8 cents per pound, respectively. Since it may be possible to produce styrene and butadiene at out-of-pocket costs of 5 and 7 cents per pound in the postwar period, it should be possible to produce GR-S at an out-of-pocket cost of 10.7 cents per pound. Adding selling expenses, profit margins, interest charges, etc., would increase cost between 2 and 4 cents a pound, so that selling price might be 13 to 15 cents a pound. Such a possibility must be considered in any postwar regulation agreement.

Technical Progress

IT IS the constant aim of the publishers of this journal to furnish full information to its readers on every development which occurs in the rubber industry. Every issue of RUBBER AGE contains a report on some new development, of major or minor importance. We wish to call your attention to two such reports in this current issue, covering developments which bid fair to make drastic changes in the industry. These are General Tire's new method of incorporating carbon black in GR-S latex (Page 577) and the new injection molding processes for rubber (Page 586). We urge that you read both articles with special care. They present implications of direct interest to every rubber manufacturing plant in the world.

CURRENT NEWS OF THE MONTH

NEW RUBBER BUREAU SET UP WITHIN WPB; BASIC REGULATIONS ARE AGAIN REVISED

FOLLOWING the recommendation of Col. Bradley Dewey, who officially retired as head of the Office of the Rubber Director on September 1 to return to his position as president of the Dewey & Almy Chemical Co., Cambridge, Mass., President Roosevelt issued a directive on that date (Executive Order 9475) abolishing the Office of the Rubber Director and transfering its authority and functions to the War Production Board. At the same time it was announced that a Rubber Bureau has been set up within WPB with James F. Clark as Director. Mr. Clark has been Assistant Deputy Rubber Director since October, 1943.

The new Rubber Bureau will function under the direction of the Operations Vice Chairman of WPB to oversee industry problems and the administration of the Rubber Order. In so doing it will follow closely the routines and policies of the Office of Rubber Director and will, as in the past, act as an over-all claimant agency for the industry requirements of special materials as well as synthetic rubber. The operation of the synthetic rubber plants and the carrying out of research, development and testing will be in the hands of the Rubber Reserve Company.

Special Committee Appointed

In announcing the formation of the new Rubber Bureau, J. A. Krug, Acting Chairman of the War Production Board, said that L. D. Tompkins, former Deputy Rubber Director, would act as a consultant to him and to Mr. Clark in connection with the operations of the Bureau, and that he had asked Col. Dewey to head a committee which would serve from time to time upon request as advisor to him on any problems that may arise in connection with inter-agency relationships as well as technical problems pertaining to all phases of synthetic rubbers and their uses.

This committee, it was said, would be made up of Col. Dewey, Chairman; L. D. Tompkins, Dr. E. R. Gilliland, former Assistant Rubber Director in Charge of Research and Development, E. B. Babcock, former Assistant Rubber Director in Charge of Product Development and Conversion, and Dr. C. C. Monrad, former assistant to Dr. Gilliland. Mr. Krug emphasized that with these men available for consultation he expected that there would be no hiatus in operations incident to the rubber industry and that it would be possible for the new Rubber Bureau to place every emphasis upon the necessity of obtaining at once the maximum number of heavy duty tires so vital at this time to the whole war program.

Mr. Tompkins is a former vice-president of the United States Rubber Company. Dr. Gilliland is one of the leading chemical engineers of the country and on the faculty of Massachusetts Institute of Technology. Dr. Monrad is in charge of chemical engineering at Carnegie Institute of Technology with a wide experience in the petroleum industry as a consultant. Mr. Babcock, who has from the start directed all problems incident to industry's conversion from crude rubber to synthetics, was for years chief chemist of the Firestone Tire and Rubber Company with a broad experience in not only the manufacture of rubber goods but also the manufacture of synthetic rubbers, as well as the development and operation of rubber plantations.

Survey on Tire Situation

In retiring from his position as head of the Office of the Rubber Director, to which he succeeded William M. Jeffers on September 15, 1943, after serving as Deputy Rubber Director since September 29, 1942, Col. Dewey stated that he had made an up-to-the-minute survey covering the production of heavy duty truck and bus tires for the past two months and that August production of such tires was about 10% above schedule. He added that there is every indication that the War Manpower Commission will be able to continue making labor available so that continued production improvement may be expected.

Based on the survey, Col. Dewey said that total production for the third quarter of 1944 should be at least 12% in excess of the July 1 forecast and since additional equipment and facilities will be in place and ready to operate by the end of that quarter, all essential military and civilian truck and bus tires should be produced during the fourth quarter of the year, providing additional manpower continues to be made available.

Due to hot weather, the survey indicated, passenger car tire production during July and August was slightly below schedule, but recent reports indicate an improvement in working hours. Summer production ran at the rate of 1,600,000 tires per month, but there is every expectation that this production rate will improve so that allocations to OPA will be at a rate which will fully satisfy demands of all B and C card drivers during the autumn and winter months.

Finally, the survey indicated that manufacturers of other essential rubber products, such as fuel cell sealing tanks, tank blocks, mechanical goods, footwear, hospital supplies, etc., have all been able to produce at a rate which approximates essential requirements.

At a press conference on the day of his retirement, Col. Dewey stated that synthetic rubber is definitely here to stay and is far superior to the natural product in many characteristics. He said that in his belief approximately one-half of the present synthetic rubber plants would be able to survive after the war, and predicted that the postwar cost of GR-S would be in the neighborhood of 15 cents a pound.

Shortly before his official retirement, Col. Dewey accused WPB Chairman Donald Nelson of what he termed "typical Washington sniping." He declared that Mr. Nelson had sarcastically informed the Senate's war investigating committee at a recent hearing that the rubber program was finished "except for getting the tires." Col. Dewey made it clear that he never claimed that the job of providing sufficient tires was done, but rather that the synthetic rubber plants were turning out more rubber than can currently be consumed. The problems of providing manpower and tire cord so that sufficient tires could be produced, he said, were vested in WPB and WMC by presidential directives.

Revise Rubber Regulations

One of the final actions of the Office of the Rubber Director prior to its liquidation was a revision of Rubber Order R-1 and its appendices, providing a compilation of all rubber directives and amendments issued to date. The revised regulations — officially termed Rubber Order R-1, as Amended August 25, 1944 —include a number of provisions reflecting progress in the continued conversion from crude to synthetic rubber. Among the new provisions are the following:

1. The revised rubber order requires all medium sized highway truck tires to contain 90 per cent synthetic rubber instead of the former 70 per cent. Furthermore, special-purpose tires, including

earth movers, rock service, logger types, have been converted in the order from 100 per cent natural rubber to 35 per cent synthetic. The increased supply of high tenacity rayon cord has made it possible to extend the synthetic rubber use to these groups of tires, since rayon produces a more satisfactory synthetic tire.

2. All truck tire inner tubes and a large group of airplane tire inner tubes are converted to synthetic rubber in the order.

3. Use of neoprene and Buna N is now permitted without restriction in all wire and cable construction, while use of crude rubber has been further restricted in wire and cable applications.

4. A procedure has been established for obtaining Buna S, reclaimed and scrap rubber for consumption in products where formerly use of these types of rubber was not permitted. Effective September 1, WPB field offices have been designated to receive applications on WPB Form 2242. WPB Form 3820 —revised (Statement of Manpower Information) must also be filed. No special authorization will be granted under this procedure if contemplated production in any way interferes with war production or with the production of essential civilian articles. Labor and facilities to manufacture non-permitted products from Buna S, reclaimed and scrap rubber must be available to the applicant and must not be required for essential purposes.

5. Elastic thread manufacturers are now permitted to use neoprene without restriction.

Tire Situation Improving

Although the manpower situation in the tire factories is still tight, there is some indication that the situation is slowly but steadily improving, particularly in the Akron area. According to the Special Tire Unit of the Army Service Forces stationed in Akron, production of large size truck and bus tires increased 4% in the last two weeks of August with the increase attributed largely to the procurement of additional male labor. Need of Akron companies for unskilled male labor for heavy duty tire production dropped 40% during August, according to this source.

It is reported that the goal for new tire workers in the Akron area was unofficially set at approximately 1,400 and that some 600 were secured during August, some of them locally but most of them from southern states. Special credit is being paid to the trained field representatives of the War Manpower Commission who have been despatched to various localities to aid in recruiting labor for urgent production programs, including heavy duty tires. A number of such representatives are already in the southern states and are reported to be doing an excellent job of sending labor to the Akron tire plants.

According to a summary on production and manpower issued on August 27 by the Office of War Information, there are still 13 war production and service programs lagging critically, including tires and tire cord. Stressing the critical shortage of tires, the report stated that although the cord twisting plants (both rayon and cotton) have overcome some of their manpower problems and the production of synthetic rubber is well ahead of schedule, the production of tires themselves is not keeping up the pace due to the manpower shortage.

Referring to the fact that the expansion of facilities for the production of high tenacity rayon tire cord is proceeding according to schedule and that supplies of cotton tire cord are "comfortable" with cotton cord production running so far ahead of consumption in the tire field that some facilities are being released to meet the increased war demands for cotton duck, the report stated that the real crux of the rubber problem is in the tire manufacturing plants themselves where some 11,000 more workers will eventually be needed. Reports to WPB and WMC are said to state that three factors are responsible for the failure of the tire industry to meet the second quarter goal, these being:

1. Enormous increase in war demands for heavy tires, which taxed existing facilities.

2. Shortage of certain types of rayon cord is holding up some desirable conversions.

3. Manpower shortage is hitting hard because most plants are located in critical labor areas (Detroit, Jackson, Mich.; Springfield, Mass.; Akron and Los Angeles).

WMC Survey Made Public

Reference to the special survey made in Akron's tire factories by WMC was made in our previous issue. A report on this survey was made public by Harry C. Markle, Akron Director for the WMC, on August 17. It indicated that heavy duty tire production in Akron could be increased from 10 to 15% during the emergency period of the next 90 days "by raising limits or goals on individual production above existing levels." It was emphasized, however, that such action must be recognized by both management and labor as "abnormal" effort volunteered by the worker to help break the production bottleneck.

The survey definitely brought out the fact that self-imposed production limits were not the only reasons for lowered productivity of heavy-duty tires during the last few months. Such factors as an uneven flow of materials due to development problems, machine failure due to lack of maintenance crew manpower, and numerous others lowered the individual tire worker's ability to produce. In all, the survey indicated that eight utilization factors are affecting tire production as follows:

1. Individual workers' ability to produce, whether caused by production limits imposed, machine failure, uneven flow of materials, lack of maintenance crew manpower or other factors.

2. Payment of "past average" wages on jobs which have been changed and on which no new incentive rates have been adopted, has been found to decrease worker productivity from 30 to 60 per cent.

3. Absenteeism.

4. Failure to make greater use of women on jobs now being performed by men.

5. Lack of streamlined production scheduling and controlling of materials flow.

6. Manpower turnover.

7. Inadequate training of both supervisory personnel and union committeemen.

THE DIRECTOR OF THE NEWLY-CREATED WPB RUBBER BUREAU

James F. Clark, former Assistant Deputy Rubber Director, who now heads the newly-created Rubber Bureau of the War Production Board, the agency which succeeded the Office of the Rubber Director, was born in North Attleboro, Mass., in 1903. He was graduated from Yale University in 1925 and in the same year joined W. G. Clark & Co., manufacturing jewelers of North Attleboro. He left that organization in 1935 to join Hemphill, Noyes & Co., investment bankers of New York City, and for the next several years was engaged in corporation work. He joined the Foreign Funds Control of the U. S. Treasury Department in April, 1942, remaining there until December of the same year when he joined the Office of the Rubber Director as an assistant to Rubber Director William M. Jeffers.

8. Insufficient co-operation in labor-management handling of complaints and grievances.

The survey also outlined three specific reasons why tire production is not meeting current demands. These are:

1. An unanticipated heavy increase for heavy duty tires in the last seven weeks. That has reflected on production because of the tremendous number of changes in demand which have been made by the rubber director's office as a result of military demands.

2. The sudden demand for heavy duty tires late in June produced an immediate shortage of husky males for work in the expanded heavy duty program.

3. While synthetic rubber production problems may have been largely solved, the use of synthetic in making heavy duty tires and tubes is still being perfected.

The WMC report also included three recommendations for increasing tire production which have been made to various locals by leaders of the U.R.W.A. This included the suggestion that for the next three months, at least, any and all "artificial limitations" on production that may have been issued by individuals or groups be removed and that local unions take a forthright stand against any groups of workers or individuals who refuse to fully utilize the machinery and other production facilities within the plant.

Shortly after public issuance of the WMC labor survey, heads of the Goodyear, Goodrich and Firestone unions termed it "inadequate and incomplete" and quite unsatisfactory. One of these leaders stated that "we can't increase production unless there is more material to keep the workers and machines busy." The charge was also made that tire workers and machinery are idle because large quantities of the material they need are being sent out of Akron to be used elsewhere to manufacture rubber goods other than tires.

MANUFACTURERS OF RUBBER EQUIPMENT MAY NOW FILL UNRATED ORDERS

Under the terms of an amendment to Limitation Order L-143-a (Rubber Processing Machinery and Equipment), issued by WPB on September 5, manufacturers of rubber processing machinery and equipment may fill as unrated orders any orders that are not authorized on Form WPB-1277, provided they do not interfere with the production or shipment of orders specifically rated on that form. The amended order makes three specific changes in the regulation, as follows:

1. Under the previous Order L-143-a, no manufacturer could produce and no buyer could accept delivery of rubber processing machinery and equipment without an authorization from the Rubber Director. This restriction is now removed, but manufacturers of, and dealers in, rubber processing machinery and equipment must fill all rated orders on their books before they can deliver unrated orders. Anyone desiring to obtain a preference rating for the purchase of new rubber processing machinery and equipment needed to fill war contracts or essential civilian orders may make application, as in the past, on Form WPB-1277 to the Rubber Bureau of the War Production Board, in Washington, D. C.

2. Used rubber processing machinery is now entirely removed from control and may be bought and sold without restriction.

3. Applications for authorization are no longer required to purchase repair parts, or to obtain permission to rebuild rubber processing machinery. Under the previous order applications were required for authorization to purchase repair parts costing more than $1,000 for any one item of machinery within a four-week period.

In issuing the amended machinery order, WPB made it clear that all of the machinery and equipment required in the tire and tube expansion program, the synthetic rubber heel and sole program, and other miscellaneous emergency programs providing products critically needed by the Armed Forces, has not yet been fully delivered. For this reason it is necessary to continue rigid control over machinery manufacturers' schedules and shipments as provided in the regulation.

Other orders issued in recent weeks of direct interest to the rubber manufacturing industry at large included the following:

COATED FABRICS

Manufacturers who compute proposed maximum prices for new coated and combined fabrics not sold during the base period of the regulation governing prices of these products may now issue invoices and accept payment at these proposed prices, subject to the approval of the OPA, according to Amendment No. 4 to M.P.R. 478 (Coated and Combined Fabrics), issued by OPA on September 5 and effective September 11. The same regulation also holds for new services.

Prior to the issuance of the new amendment, a manufacturer could not accept payment for any such fabric or service until his proposed maximum price, and data used in computing it, had been reported to OPA and a maximum price approved. Experience has shown that it is unnecessary in most cases to require the manufacturer to wait until the proposed price has been approved before allowing him to accept payment. The methods provided for establishing such prices permit manufacturers to compute proposed prices accurately, and in most cases these prices have been approved later by OPA, that agency said.

The new amendment therefore permits manufacturers to issue invoices at the proposed maximum price and accept payment, pending OPA approval. However, until the proposed price has been approved, or until 15 days have expired without notice of disapproval from OPA, invoices must carry a notation that the quoted price is subject to OPA approval. If the price approved is less than the price on the invoice, the invoice must be corrected, and if payments have been collected in excess of the approved price, refunds must be made.

It is now necessary, when submitting data for a proposed price for a new fabric, to furnish a more complete break-down of direct material costs including rubber, fabric or base materials, other materials, and finishing costs. This break-down of costs, which was not formerly required, is necessary so that OPA can determine whether a proposed price is consistent with the level of prices fixed by the regulation. The additional information will be furnished on the revised form described in Appendix A of the regulation.

RECLAIMED RUBBER

To help compensate manufacturers for increases in scrap rubber, labor and other costs, that have occurred since December, 1941, when present reclaimed rubber ceilings were established, the maximum prices for reclaimed rubber have been increased one-quarter cent per pound by OPA as of September 13. The increase is also permitted on charges for the service of processing scrap rubber furnished by the buyer into reclaimed rubber, although only a very small percentage of reclaim is produced in this way. The changes were covered in Amendment No. 5 to R.P.S. 56 (Reclaimed Rubber) and Supplementary Service Regulation No. 35 to R.M.P.R. 165 (Services).

A financial study by OPA of data submitted by a representative group of reclaimed rubber manufacturers for the second calendar quarter of this year indicated that the industry's current dollar earnings before income taxes are below its average earnings before income taxes for a representative period of peacetime production from 1936 to 1939. The price increase of one-quarter cent per pound was found necessary to restore the industry to a normal earning standard. The increase is the minimum required by law to make prices generally fair and equitable, OPA said.

The Reclaimed Rubber Manufacturers' Industry Advisory Committee originally recommended a greater increase, but, after discussion with OPA officials, it formerly recommended the quarter cent increase at this time and that OPA make periodic reviews of the industry in the future to determine whether or not further action should be taken.

Ceiling prices for reclaimed rubber vary, as they are the highest prices

charged by each seller during the base period—November 5, 1941, to December 5, 1941.

(EDITOR'S NOTE: In reply to newspaper charges that thousands of tons of scrap tire and other rubber products were rotting away in government salvage stockpiles, Howard J. Klossner, president of the Rubber Reserve Corp., announced on August 30 that all salvageable tires will be removed from storage yards within the next few weeks and the remaining scrap will be fed to the reclaimers as rapidly as possible. He said that most of the usable casings collected in the salvage drive two years ago have long since been disposed of and assertions that "millions" of tires are rotting in government storage yards are completely erroneous.)

MISCELLANEOUS ORDERS

Allocation controls from civilian production of butadiene and styrene were removed by WPB on August 25 because "they are now in sufficient supply as the result of improved production techniques." Control was lifted by revoking Order M-178 (Butadiene) and an amendment to Schedule 18 (Styrene and Dichlorostyrene) of Order M-300, the general chemicals regulation.

To assure more equitable distribution of synthetic organic soaps to industry, these soaps have been placed under allocation control by the addition of Schedule 44 to Order M-300. The control applies only to supplies for the military services and industry will continue to receive allotments in accordance with the established preference rating procedure now in effect. This will assure the military of an adequate supply without resort to large stockpiling.

Schedule 14 of Order M-300, covering the allocation of pine tar, has been amended to increase the small order exemption to 54 gallons per person per month. Suppliers seeking authorization to deliver pine tar must file application on Form WPB-2946 (formerly PD-601) on or before the 20th of the month preceding the month in which delivery is proposed.

ODT VISUALIZES CRITICAL TIRE SITUATION THROUGH FOURTH QUARTER

Despite prediction in other official and semi-official circles that sufficient tires will be produced during the balance of the year to meet all essential needs, Col. J. Monroe Johnson, director of the Office of Defense Transportation, stated on September 6 that the severe shortage of heavy duty truck and bus tires for replacement purposes will continue through the fourth quarter of the year and that a spread of the tire shortage to the smaller size truck tires is in prospect.

Colonel Johnson said fourth-quarter tire allocations by the War Production Board for October, November and December were far below basic requirements on tires in sizes 8.25 x 20 and up. Because of its decision to satisfy expanded military requirements the WPB, in acting upon an ODT appeal from the unsatisfactory civilian allocation, increased heavy-duty allotments only slightly and made a drastic cut in the smaller size truck tire allotments. The resulting deficit in smaller size tires will affect principally farm trucks and those used in making deliveries of milk, bakery products, laundry and in performing many other essential services, the ODT director said.

The allotment of tires for replacement purposes reflects drastic curtailment by ODT in its assignment of tires for new vehicles, the ODT director explained. The number of tires actually assigned for original equipment on new vehicles in the fourth-quarter is 206,056, which represents a 35.4 per cent decrease from the amount originally requested to meet the new vehicle program in full.

"Also, the volume of tires remaining for replacement purposes will permit rationing at the rate of only 96,832 tires in sizes 8.25 x 20 and larger per month," Colonel Johnson said. "This level is but slightly more than one-half of the estimated requirements of 189,599 such tires needed to restore essential motor services to the approximate volume actually supplied during the first six months of 1944.

"The 96,832 heavy-duty tires that can be made available through the rationing system each month during the fourth quarter fail by a substantial margin to satisfy replacement requirements of the services rated with top priorities 1 and 2 in the War Production Board and War Food Administration Essentiality List."

The ODT director said that after meeting new vehicle program needs, the fourth-quarter allotment of tires in the 7.50 x 20 and smaller sizes will provide 251,052 tires monthly in these sizes for replacement purposes or enough to supply only 72.7 per cent of the requirements of essential operators. These estimated requirements were placed at 345,272 tires monthly.

Reports received by the ODT, Colonel Johnson said, indicate that widespread curtailment of essential motor transportation services has already taken place because of the shortage of heavy duty tires. Trucks down include a considerable number which haul aviation gasoline to airfields, he said, and although this service has been given the highest tire priority, tank truck operators frequently cannot obtain tires after they have secured certificates.

September Tire Quotas

Tire quotas for September were announced by OPA on August 27. The new figures underline the continued necessity for large-scale recapping, the principal changes from the August quota being an increase in heavy truck tires from 85,000 to 102,000 and a decrease in passenger car and motorcycle tires from 1,950,000 to 1,600,000. Quotas of light truck tires, light tractor-implement tires, and heavy tractor-implement tires are unchanged from August, the figures being 280,000, 55,000 and 23,000 respectively.

The cut in passenger car and motor cycle tire quota will not mean any corresponding cut in eligibility, OPA said, but it does mean a still more difficult job for local War Price and Rationing Boards in deciding who among the many applicants for new tires are the most essential drivers.

Even with the much higher quotas in effect for July and August, boards have not been able to keep up with demand. The reduced September quota of 1,600,000 passenger type tires will give boards very little margin over current replacement needs with which to catch up on the accumulated backlog of applications now standing at about 1,000,000 tires.

It is expected that the OPA Emergency Tire Panel Boards, which were set up last month to process applications for heavy truck tires, will continue in operation for several more months. The carrier essentiality list, used as a guide by these panels, will also have to be continued in use, OPA said, until allocations increase substantially.

Changes in Ceiling Prices

Several minor changes in the regulation establishing ceiling prices on retail sales of new tires and tubes, on retail and wholesale sales of used tires and tubes, on recapped tires and recapping, and on the repairing of tires and tubes have been instituted by OPA. These changes are incorporated in Amendment No. 1 to M.P.R. 528 (Tires and Tubes, Recapping and Repairing).

Because previous ceilings were shown to be below average factory costs, maximum prices for recapping five large sizes of truck and bus tires with road grader type of tread (12.00-24 to 14.00-24) have been increased approximately $10 per tire. Specific maximum retail prices have been added for a new motorcycle tire and tube size (3.85-20) and for three new farm tractor tire sizes (4.00-12, front; 7.50-10, front; and 9.24, rear).

The amendment also provides that maximum retail prices for synthetic special purpose tubes, defined as designed to be puncture-resisting by the use of an extra layer or layers of soft rubber or plastic material or by the use of a dual tube construction, will be provided upon application to OPA at Washington. Sales in Alaska are no longer covered by the regulation. Finally, various parts of the regulation were reworded for clarification purposes or to correct minor errors, but none of these makes any change in prices or pricing methods.

Temporary retail ceiling prices for off-the-road tires made with rayon fabric for the period from August 10, 1944, to October 15, 1944, were established by OPA on August 9 with the issuance of Order No. 10 to M.P.R. 528. The ceilings are 112½% of the previously established maximum price for the same type size and ply new tire made of cotton fabric.

Distribution of Surplus Tires

A plan for the redistribution of surplus tires has been worked out by the Office of Surplus Property, Treasury Procurement Division, Washington, D. C. The plan provides for national distribution and has already been tested in the disposal of 70,000 tires declared surplus by the Army.

A group of 25,000 new and 31,000 used small truck tires were sold back to twenty-three of the twenty-six tire manufacturers in the United States, each receiving an allotment based on their usual replacement business. These manufacturers will, in turn, pass them on to regular distributors, thus assuring a wide distribution.

The plan will be followed by the Automotive Division of the Office of Surplus Property as other tires become available as surplus.

Amendments to Ration Order

Three additional amendments to Ration Order 1A (Tires, Tubes, Recapping and Camelback) have been issued by OPA since our last report, as follows:

Amendment No. 84, issued September 7 and effective September 11, provides that no board other than an Emergency Truck Tire Board shall issue a certificate for a truck tire with a cross-section size 8.25 or larger, unless it has been instructed to do so by such a board or by a district director, and that the latter may act only when a decision must be reached before the board can be convened.

Amendment No. 85, issued September 11 and effective September 15, states that tire inspection records will not be used in rationing after current "A" gasoline ration books expire. These records have been used primarily as a record of gasoline rations issued each automobile, since the periodic tire inspection program was discontinued last April.

Amendment No. 86, issued September 12 and effective September 16, requires tire dealers who sell to consumers to sell any new tire in their inventory to any person who presents a valid tire rationing certificate and the purchase price of the tire. Dealers are also required to post daily inventories of their stock of tires with a cross-section size of 8.25 or larger.

Report on Overloading Tests

The Government Tire Test Fleet operating at San Antonio, Texas, recently completed an exhaustive series of tests on the effect of overloading on three popular sizes of civilian highway truck tires on rear drive wheels. Sizes tested were 7.00-20 (10-ply), 9.00-20 (10-ply) and 11.00-20 (12-ply).

The comparative tests included a total of 148 tires, run at various speeds, and the results clearly show the marked extent to which tire mileage is reduced by overloading at 30% above the maximum recommended loads of the Tire & Rim Association. Following are the ratings obtained from the test, the figures being the average of all truck tires included in the comparative tests:

RATING FOR TREAD WEAR
(Design Wear)

T&R Max. Recmd'd Load	*30% Over T&R Max. Load*
100	84

RATING FOR CARCASS DURABILITY
(Blowouts, Separations, Etc.)

T&R Max. T&R Max. Load	*30% Over T&R Max. Load*
100	33.3

Allen Resigns as RDC Head

Douglas H. Allen, who has been president of the Rubber Development Corporation since its formation in February, 1943, has resigned from that post, as of October 1. He will, however, continue as a director of the corporation. Francis Adams Truslow, vice-president, has been named as his successor. Mr. Allen, who attributed his resignation to "urgent private reasons," has served the government for two and one-half years, first as special assistant to the president of the Rubber Reserve Corp. and then as president of RDC. Mr. Truslow, the new president, has served the corporation for two years as its special representative in Peru and as vice-president and director in Washington for the past several months.

Correct Prices of Neoprene

In our previous issue we indicated that the new price for Neoprene Latex Types 571, 571 Concentrated, 572 and 60 is 36c per pound in tank cars. It has since been called to our attention that that price applies only to tank carloads of Type 571 only, since no tank car prices are currently being quoted on the other types. Prices of all four types of neoprene latex in drums, lcl, per pound are: Type 571, 40c; Type 571 Concentrated, 42c; Type 572, 46c; Type 60, 44c.

Carlton Scheduled to Speak

C. A. Carlton, manager of the development division of J. M. Huber, Inc., is scheduled to be the principal speaker at the next meeting of the Northern California Rubber Group, which will be held on Tuesday, October 10, at the Hotel Claremont, in Berkeley, Calif. Mr. Carlton will discuss the compounding of GR-S.

Cramer Receives Promotion

N. J. Hooper, vice-president of Sharples Chemicals, Inc., Philadelphia, Penna., has announced that Dr. Howard I. Cramer, who has been in charge of the development of rubber chemicals since 1941, has been appointed director of development of the company. At the same time, he announced that George E. Hinds, formerly assistant to the vice-president in charge of research and development, has been promoted to the position of director of technical coordination, and Perrin G. Smith, formerly a group leader in charge of catalyst research at the Research Department in Wyandotte, Mich., to assistant to the director of development. From 1929 to 1933 Dr. Cramer was associated with the Goodyear Tire & Rubber Co. at Akron and from 1933 until he joined Sharples Chemicals in 1941 he was assistant professor in charge of rubber chemistry at the University of Akron.

Changes at Williams-Bowman

Several changes in executive personnel have been announced by the Williams-Bowman Rubber Co., of Cicero, Ill. W. J. Williams, with the company for 41 years, has been elected chairman of the board, while J. C. Bowman, after 16 years of service, advances to the position of president. H. R. Brekke, with the company for 40 years, has been made first vice-president. Frank Smith, with 15 years of service, becomes assistant superintendent, while J. E. Martin, who has served as superintendent for the past 14 years, continues in that capacity. The company was established in 1903 as a jobbing organization and entered the rubber manufacturing field 36 years ago.

Yoran Joins Brown Rubber

Calvin Yoran, for several years chief chemist of the former Featheredge Rubber Co. of Chicago, and who more recently was associated with the Witco Chemical Co. as chief chemist, has been appointed research and technical director of the Brown Rubber Co., Inc., of Lafayette, Indiana. Dr. Yoran holds a B.S. and Ph.D. degree from the University of Chicago and is a member of both the American Chemical Society and the American Institute of Chemists. In his new position, he will be responsible for postwar product developments.

Pharis Tire Arranges Loan

The Pharis Tire & Rubber Co., Newark, Ohio, has announced that it has negotiated a 4% 10-year note in the amount of $1,000,000 with the Mutual Life Insurance Co. of New York City. Approximately $450,000 of the proceeds will be used to pay back borrowings incurred in the recent acquisition of Molded Materials, Inc., Ridgway, Penna., and the Carlisle Tire & Rubber Co., Carlisle, Penna. The balance will be used for additional plant and warehouse facilities and for working capital.

GOODYEAR DEVELOPS NEW POLYMERIZATION PROCESS

A new continuous polymerization process which speeds up the rate at which GR-S latex is polymerized by 40 per cent has been revealed by Dr. R. P. Dinsmore, vice-president in charge of research and development of the Goodyear Tire & Rubber Co. Since the polymerization step has been the limiting factor in total capacity of the synthetic rubber plants, the new process is said to offer a potential 40 per cent increase in the nation's output. Furthermore, according to Dr. Dinsmore, it results in a more uniform synthetic rubber with better working qualities.

40% Additional Tonnage

Existing GR-S polymerization plants represent a capital investment of approximately $200,000,000 and the Goodyear development, it is pointed out, is the equivalent of $80,000,000 worth of new synthetic plants. But so simple is the improvement that the 40% additional tonnage is made possible at about 1% of the original capital cost of a producing plant, and the slight additional investment would be compensated for in a matter of 18 weeks through the more efficient utilization of raw materials which the operation makes possible.

As originally built, the nation's synthetic rubber plants had a capacity for the production of 735,000 long tons of GR-S per year. Subsequent improvements made it possible to increase their capacity to 130% of their original "design capacity." If fully utilized, the new Goodyear process would add another 40%, thus bringing the plants up to 182% of their design capacity or a total production potential of 1,338,000 long tons.

According to Dr. Dinsmore, the continuous operation is so designed that more efficient, automatic control of the process is obtained than was possible with the batch type of operation, resulting in a rubber that can be more easily milled, thus reducing milling time. It is interesting to note that while the new process links a group of reactors into a chain, it actually requires fewer pipes, pipelines and valves than are now needed when each reactor is operated as an individual unit.

In connection with the announcement of the new process, it was revealed that the process has been used in the government-owned polymer plant operated by Goodyear at Houston, Texas, for the past several months, and that plans are now being drawn to use it in the Goodyear-operated plants in Akron and Los Angeles.

Operation of the Process

Until the present development, the polymerization of GR-S was carried out by the "batch" type of operation, in which each reactor is handled as a separate unit, the latex being withdrawn from the reactor after the butadiene, styrene and other elements have been fully reacted. In the continuous polymerization process the reactors are connected together by pipe lines in groups to form a continuous chain.

Carefully timed pumps admit the ingredients in a continuous stream into the first reactor and the reaction takes place as the mixture moves through the chain of reactors, with GR-S latex pouring forth from the last reactor in a continuous flow. With the reactors hooked together, the need for temperature changes at various stages of the process is handled without loss of time as the latex moves from one unit to another.

The continuous polymerization process speeds up the production of GR-S for a number of obvious reasons. Under the batch type of operation it took about an hour to fill a reactor and another hour to empty it. In addition, it was found impracticable to operate a reactor completely full. Consequently, each reactor was filled to only 90 per cent of its capacity. Because of the shrinkage which takes place during polymerization, the reactor was only about 81 per cent full when the reaction was stopped and the latex discharged.

Still more time was lost because the extraneous gases which gathered above the liquid in the 90 per cent filled tank slowed up the start of the polymerization process by as much as an hour. In the continuous process, all reactors are 100 per cent full at all times and no time is lost in filling or emptying the reactors or in waiting for the polymerization process to get under way.

Open New Chile Factory

The new tire plant operated by Industria Nacional de Neumaticos, S. A., an affiliate of the General Tire & Rubber Co., Akron, was put into operation in Santiago, Chile, earlier this month. Production will currently be limited to truck tires to ease the strain on Chile's transportation system, but eventually the plant will turn out enough tires of all types to serve the country's entire needs. Fred Comey, of General Tire's engineering staff, has been named factory manager of the new plant, which will rely on the Akron company for all technical supervision. Clarence Perkins will serve as commercial manager, Logan Molenauer as chief chemist, Diego Ybarra as chief engineer, and Carroll Ogden as general foreman. General Tire first entered Latin America as a tire manufacturer in Mexico 14 years ago and in 1941 opened a plant at Caracas, Venezuela. The Santiago venture is the company's third in Latin America.

BATTLE-WORN TIRES USED AS MUTE APPEAL FOR INCREASED PRODUCTION

A group of battle-worn military tires, some of which are reproduced above, is making a unique appeal to tire builders in the Akron plant of the Goodyear Tire & Rubber Co. to speed up production of heavy-duty military tires. The mutilated tires have been returned from the battle fields of Europe and North Africa and stand as graphic witnesses of some of the trials of American soldiers overseas. All have undergone rough and ready repairs. Shrapnel gashes have been stitched together with cord and torn treads have been riveted on with bolts. They reveal the desperate makeshift devices employed by fighting men to keep the tires rolling just a little longer and are directed at the current 30% production lag in tire production, which is reported to be improving slightly.

PROJECT SEEKS REDUCTION OF COATED FABRIC WEIGHT

The War Department has announced that a project to reduce further the weight of coated fabrics which a soldier must carry on his back in the form of a raincoat, poncho, etc., has been undertaken by the Office of the Quartermaster General in cooperation with the Brooklyn (N.Y.) Polytechnic Institute and the National Research Council. Basic research in the new program will be carried on at the Institute under the direction of Dr. H. Mark.

The problem of reducing to a minimum the soldier's pack load has been constantly before the Quartermaster Corps, and each type of terrain over which American fighting men have been called upon to operate has posed new questions in the matter of equipment. While research on this problem has been under way for some time, the new project is designed to correlate results of these previous studies, and to seek to develop new coatings and applications.

In addition to the objective of reducing the weight of coated fabrics the research project will seek to improve the aging characteristics, abrasion resistance, adhesion, low temperature flexibility, and other factors which are still not perfected. At the same time, the research will seek to develop new plasticizers for the plastics used in fabric coatings, due to the shortage of phthalate plasticizers now widely used.

The project on coated fabrics is to be carried on in addition to a program, similarly set up on a cooperative basis, which is seeking to develop new types of plastic films and methods for controlling water-resistance and other characteristics of plastic films widely used in protective coverings for food, equipment and other supplies being shipped to our armed forces in all parts of the world. This project, too, is being conducted at Brooklyn Polytechnic Institute.

While both projects involve the use of plastics, the "film" project deals only with so-called unsupported films, that is, sheets of material made wholly from synthetic resin or other plastics, whereas the coated fabric project deals with the application of a coating of some sort of plastic to a woven fabric, or cotton, nylon or other material, to make it waterproof, toughen it, or to give it other desired characteristics.

Expands Fisk Tire Plant

The production facilities of the Fisk Tire plant of the U. S. Rubber Co. at Chicopee Falls, Mass., have been considerably expanded in recent months, to the point where production of tires at the plant has practically been doubled. Two new modern buildings, one for tire production and the other for tire cements, have been erected and added to the plant layout which comprises 186 acres in its overall area. The Fisk plant now employs about 3,300.

Coming Events

Sept. 21. Buffalo Rubber Group, Hotel Westbrook, Buffalo, N. Y.

Oct. 3. Los Angeles Rubber Group, Mayfair Hotel, Los Angeles, Cal.

Oct. 3-5. 33rd National Safety Congress & Exposition, Hotels Sherman, Morrison and LaSalle, Chicago, Ill.

Oct. 6. New York Rubber Group, Building Trades Club, New York.

Oct. 10. Northern California Rubber Group, Hotel Claremont, Berkeley, Calif.

Oct. 16. Ontario Rubber Group, Toronto, Ont., Canada.

Nov. 15-19. Third National Chemical Exposition, Coliseum, Chicago, Ill.

Nov. 19-21. American Institute of Chemical Engineers, St. Louis, Mo.

New Liquid Mold Lubricant

Colite Concentrate, a new liquid mold and mandrel lubricant, has been introduced by the Beacon Co., 89 Bickford St., Boston, Mass. The new material is said to be both non-toxic and non-tacky and to leave the molds exceptionally clean because building up does not occur. When Colite Concentrate is used, removal of the cured rubber from the mold is reported to be simplified and the finished product has a transparent, satin-like finish. According to Beacon, one part of Colite Concentrate to eight parts of water is sufficient for general lubricant purposes.

Forms Chemicals Department

The Quaker Oats Co., Chicago, producer of furfural and allied chemicals, has announced the formation of a chemicals department. The new department will integrate sales, research and production heretofore carried out by various divisions of the company. The furfural and technical divisions become merged with the chemical department under the new plan and their former designations will be discontinued. Dr. Lauren B. Hitchock, former manager of sales development for the Hooker Electrochemical Co., Niagara Falls, N. Y., heads the new department.

Form New Sales Agency

Karl W. V. Nix, well-known representative in the Akron area, and Harry L. Swain, former fabric buyer for the Firestone Tire & Rubber Co., have formed a partnership under the name of the Karl W. V. Nix Company to represent industrial fabric mills. The new company has its headquarters in the Akron Savings & Loan Building in Akron.

SYNTHETIC DEVELOPMENTS REPORTED FROM SWEDEN

According to reports reaching the U. S. Bureau of Foreign & Domestic Commerce from Sweden, every effort is being made in that country to produce sufficient synthetic rubber to make up the lag in crude rubber imports. One company is reported to be producing about 300 metric tons of Thiokol A-type rubber annually, this being used for packing, insulation, hose and soles. The base of this rubber is said to be ethylene dichloride.

A combination Thiokol-Neoprene, called "Telex," is being produced at Gilslaved by what is known as the Ehrensvard-Nilsson process. According to press statements, the factory at Gilslaved planned to produce 200 metric tons of this product annually—but very little has been heard of the project in recent months.

A factory being built at Ljungaverk for the manufacture of Neoprene will have an annual capacity of 400 metric tons. The plant, which was due to go into operation early in the present year, will use the Svedberg process based on coke and limestone from which calcium carbide is obtained, which in turn yields acetylene. Assisted by a catalyzer, monovinyl-acetylene is formed, which, when treated with hydrochloric acid, forms chloroprene. This is polymerized to form Neoprene.

Plans are under consideration to double the capacity of the plant still under construction and to erect an additional plant with an annual capacity of 800 metric tons—making total annual capacity 1,600 metric tons.

Will Stress Developments

How the chemical industry has contributed to the war effort and its effect on the immediate postwar period will be emphasized at the Third National Chemical Exposition which will be held at the Coliseum in Chicago on November 15 to 19 under the sponsorship of the Chicago Section of the American Chemical Society. Practically all available exposition space has already been contracted for and negotiations are now being conducted for additional room at the Coliseum. Headquarters for the Exposition are maintained at 330 South Wells Street, Chicago, Ill.

Absorbs C.B. Webb Co.

Manufacturing operations of the C. B. Webb Company, for many years located in Lebanon, Penna., have been taken over by the firm of Wintark, Inc., 4216 West Ogden Ave., Chicago 23, Ill. The Webb concern manufactured rubber toys and specialties in prewar days. C. A. Webb, who acted as factory manager for the Webb concern in Lebanon, is president of Wintark, Inc.

IMPROVED SYNTHETIC RUBBER DEVELOPED BY GENERAL TIRE

An improved form of GR-S which is said to cut milling time by fully one-third has been developed by the General Tire & Rubber Co. The development resulting in the new synthetic, which General Tire calls "Homojetized Rubber," permits the mixing of synthetic latex with carbon black at the polymer plant just prior to the coagulation of the latex.

The system, developed by General Tire's research men in Akron, is said to result in a perfect mix. Carbon black is wetted down and added to the synthetic latex in the form of slurry. After coagulation and drying, the carbon black is reported to be perfectly distributed throughout the rubber. No change, other than the addition of the black, is made in the GR-S process.

Chief advantages of the new process, according to General Tire, include reduction in milling time of 35%, reduction in manpower in milling operations by 35% and release of that manpower to other departments, reduction in power consumption by 20%, and reduction in cost of production. (EDITOR'S NOTE: The basis of some of these claims will be found in a technical article on the new process which appears elsewhere in this issue.)

The new process was developed by Gilbert Swart, research director of General Tire, working in cooperation with Harold Pushee, chief chemist, and Robert Iredell, chief engineer. General's research men have been collaborating for some time with the chemical department of the Carnegie Institute of Technology, under Dr. Webster E. Jones, and with the chemical department of Purdue University, under Dr. Henry B. Hass. Technologists of both of these universities aided Mr. Swart in developing the original discovery.

The new process was demonstrated at the National Press Club in Washington on August 28 at which time it was revealed that approximately 25% of the production facilities at the government-owned polymer plant at Baytown, Texas, operated by General Tire in conjunction with the General Latex & Chemical Co., has already been converted to the production of the new type synthetic, and plans call for additional conversion shortly. The process has been offered to operators of other government-owned plants and some conversion is planned for these plants as well.

Comparing the old method, left, and the new method, right, are (left to right) Gilbert Swart, General Tire research director, William O'Neil, General Tire president, and Stanley Crossland, vice-president of the Rubber Reserve Co.

Ohio Rubber Leases Plant

The Ohio Rubber Co., Willoughby, Ohio, has leased a plant at Conneautville, Ohio, and is making improvements both in the plant and the surrounding grounds. The company plans to make this a permanent rubber manufacturing plant and will operate it on a 24 hour basis for the present.

Steel-Cable Carcass Belt

A rubber belt with a steel-cable carcass which can be loaded to roughly seven times the tension of the heaviest belt now manufactured has been developed by the Goodyear Tire & Rubber Co., Akron. Weighing a total of 2,730 pounds, the belt is intended for use with a machine at Wright Field for testing airplane tires and brakes. Goodyear engineers state that when looped this belt can withstand a pull of half a million pounds. The belt includes 750 pounds of cotton in 6 plies of fabric which house the steel cables between exterior sheaths of synthetic rubber. There are 600 steel cables extending over the belt's width. Each cable consists of seven strands and each strand consists of another seven brass-plated steel wires.

Introduce New Materials

Several new compounding materials have recently been developed and introduced by Herron Bros. & Meyer. These include "Silical," a reinforcing filler for use in wire insulation compounds, and "Dielex" and "Dielex-Alba," two organic dielectrics for use in similar compounds. Silical is Newfoundland pyrophyllite and is said to feature easy processing, low water absorption, good electrical properties, high modulus, and low permanent set. It is mica free. Dielex is compounded gilsonite and Dielex-Alba is a synthetic white wax. Both of these organic dielectrics offer low water absorption, high modulus, low capacitance, low power factor, and high resistivity. They are also said to be easily processed. Herron Bros. & Meyer maintains offices at 82 Beaver Street in New York City and in the Ohio Building in Akron, Ohio.

Additional "E" Awards

Included among companies receiving the Army-Navy "E" award in recent weeks for production efficiency were the Mine Safety Appliance Co., Pittsburgh, Penna., and the Newburgh plant of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. In addition, a second renewal star, indicating continued efficiency, has been awarded to the Resinous Products & Chemical Co., Philadelphia, Penna. It was also announced that the Maritime "M" award for production efficiency has been awarded to three plants of the Farrel-Birmingham Co., Inc.

Let Contract for Topeka Plant

A general contract for the construction of its new tire plant at Topeka, Kansas, has been let by the Goodyear Tire & Rubber Co., Akron, to John A. Johnson & Sons, Inc., of Brooklyn, N. Y. The new plant, a Defense Plant Corporation unit, is expected to be ready for operations about the first of the year and will employ approximately 400 when full production schedules are obtained. A subsidiary company, the Goodyear Tire & Rubber Co. of Kansas, Inc., will operate the plant.

Ontario Group To Meet

The Ontario Rubber Section of the Chemical Institute of Canada will meet on Monday, October 16, in Toronto, Canada. Present indications are that Dr. John T. Blake, director of research of the Simplex Wire and Cable Co., Cambridge, Mass., will address the group. It is expected that the meeting will be preceded by a joint dinner at the Royal York Hotel.

NAMES IN THE NEWS

WILLIAM SPANTON, associated with the American Hard Rubber Co., Akron, for the past 47 years, for the last 26 years as employment and safety supervisor for the Akron plant, has retired from that organization.

WILLIAM J. VACHOUT, formerly associated with the Marshall Eclipse Co. and the Bendix Aviation Corp., has been appointed comptroller of the Pharis Tire & Rubber Co., Newark, Ohio.

GORDON SPILLETTE, former manager of production and scheduling at Mill 4 of the B. F. Goodrich Co., Akron, has been named staff manager of the factory service department of that organization, succeeding PAUL W. WATT, who held the position for several years before his recent appointment as manager of the department.

WALTER P. HALLSTEIN, JR., who started with the Goodyear Tire & Rubber Co. in 1934 as a member of its Flying Squadron, has been appointed assistant manager of the belt sales department of the Mechanical Goods Division.

L. F. WEYAND, general sales manager of the Minnesota Mining and Manufacturing Company's adhesive and coatings division since 1936, has been promoted to general manager. His headquarters will remain at the 3-M factory in Detroit, Mich.

ELDON V. ROMAINE recently head of technical sales for E. W. Colledge, General Sales Agents, Inc., New York City, has been appointed as assistant to DAVID LEWIS, chief of the Naval Stores Unit, Chemicals Bureau, WPB.

B. R. NEWCOMB, until recently associated with the American Optical Co., has been elected president of the John Waldron Corp., New Brunswick, N. J. S. N. FINNEY and F. W. EGAN, both long associated with the Waldron organization, have been elected vice-presidents of the corporation.

L. W. FOX, former military service engineer for the Firestone Tire & Rubber Co. in Washington, D. C., and Detroit, Mich., has returned to the Akron offices of that organization to act as manager of the Field Engineering Division of the Tire Development Department.

J. S. "STEVE" CORRIGALL, until recently associated with the Thiokol Corporation, has joined the R. T. Vanderbilt Co., 230 Park Ave., New York City, and will cover the New Jersey and Eastern Pennsylvania territory for that company.

JAMES M. CROWE, formerly managing editor of *Chemical Industries*, has joined the Heyden Chemical Corporation of New York City in charge of advertising and market development.

W. E. EBERTS, for the past four years advertising and sales promotion manager of the Pharis Tire & Rubber Co., Newark, Ohio, has been commissioned a lieutenant (j.g.) in the Navy.

LITTLETON C. BARKLEY, manager of the New York office of the Manhattan Rubber Manufacturing Division of Raybestos-Manhattan, Inc., has been appointed sales manager of the division's mechanical rubber goods sales department. For the present he will retain headquarters in the New York office.

DR. ARTHUR W. SLOAN, head of rubber chemicals research for the B. F. Goodrich Co., has left for Cairo, Egypt, to take up new duties as chief of chemical allocations in the Middle East for the Foreign Economic Administration. He will return to Goodrich in the future.

EDWARD A. WILLSON, associated with the B. F. Goodrich Co. since 1928, has been appointed resident supervisor of the synthetic rubber laboratories operated by Goodrich at Kent State University, Kent, Ohio.

HUBERT GLATTE, former assistant purchasing agent for the National Gypsum Co., has been appointed district engineer for the Industrial Oven Engineering Co., Cleveland, Ohio, and will cover the Western New York territory for that firm.

H. L. POST, manager of the Shoe Products Division of the Goodyear Tire & Rubber Co., and J. E. COX, general superintendent of the Windsor Manufacturing Co., Windsor, Vt., a Goodyear subsidiary, have been appointed general manager and assistant general manager, respectively, of the Windsor firm.

H. C. KENYON, associated with the Minnesota Mining and Manufacturing Co., St. Paul, Minn., since 1922, has been advanced to the position of general sales manager of the Inland Rubber Corp., Chicago, Ill., a subsidiary of that organization.

J. G. KREYER, who has been on leave of absence from the Firestone Tire & Rubber Co., Akron, for special work with the armed forces, has returned to his former position as manager of Firestone's farm tire development department.

D. E. HENDERSON, who has been acting as technical sales engineer for the Hycar Chemical Co. for the past year, and who previously was associated with the Goodrich organization, has left Hycar to join the Associated Rubber Products Co., Irvington, N. J., as technical director of its Quakertown, Penna., plant.

JEROME W. BRUSH, JR., who has been associated with the Raybestos Division of Raybestos-Manhattan, Inc., Bridgeport, Conn., for some time, has been appointed manager of the Rubber Products Department of that division.

IRVING EISBROUCH, vice-president in charge of tire sales of the Dayton Rubber Manufacturing Co., Dayton, Ohio, has been elected chairman of the OPA Tire and Tube Manufacturers' Advisory Committee, succeeding R. S. WILSON, vice-president of the Goodyear Tire & Rubber Co., who has resigned after a year's tenure of office.

J. S. WALTON, professor of chemical engineering at the University of Oklahoma, who has been serving as a technical consultant of the Rubber Reserve Co., has returned to the University after a year's leave of absence.

D. W. SANFORD, sales manager of the Western Division of the Goodyear Tire & Rubber Co., has been named resident vice-president of the Goodyear Tire & Rubber Co. of California. He succeeds J. E. MAYL, who has returned to Akron as head of the company's tire sales division.

HERMAN RUBENSTEIN, connected with the research department of the Dryden Rubber Co., Chicago, Ill., for the past several months, has been appointed stock and waste control supervisor of that company. He was formerly connected with the B & L Rubber Co. and the Gits Molding Co.

A. E. HOSIER, chief chemist of the Faultless Rubber Co., Ashland, Ohio, was guest speaker at the regular meeting of the Ashland Junior Chamber of Commerce on August 10. He spoke on synthetic rubber in general.

HOWARD H. BERGER, previously connected with the Plymouth Rubber Co., Canton, Mass., has joined the Middletown Rubber Corp., Middletown, Conn., in the capacity of chemist.

A new method of electro-depositing pure hard iron on metallic and nonmetallic materials, including wood, rubber and plastics, was recently announced by U. S. Rubber. The iron deposited by the new method chemically resembles Swedish steel, it was said, and may be hardened by carburizing and heat treating to give a hard, abrasion-resistant surface.

Develop Steel-Spring Wheel

A steel-spring wheel, invented in Switzerland and known as the Meili "S" wheel, is being manufactured in Sweden to replace rubber tires, according to a report made to the U. S. Bureau of Foreign & Domestic Commerce. The springs are described as being bent in the form of an "S" and arranged in a manner to give double spring action which protects the chassis and equipment from road shocks. There are two sets of springs, the outer set adapting themselves to the rough portions of the road and the inner springs elastically supporting the weight of the truck from the hub. These wheels reportedly have been used successfully in Sweden on trucks carrying loads of 4 metric tons and driven at a speed of 65 kilometers an hour on snow-covered forest roads that are impassable for vehicles with rubber tires and chains. A truck fleet hauling 3.5-metric-ton loads of wood from the forests during winter months also has used successfully the new steel-spring wheel.

Goodyear Develops New Tread

A new tread design for truck tires of synthetic rubber, to be known as the "Hi-Miler S Rib" tread, which is said to retard the growth of tread cracks and reduce running temperatures by as much as 50 degrees, has been developed by the Goodyear Tire & Rubber Co., Akron. In the new tread, made exclusively for synthetic rubber tires, retarding of crack growth is accomplished by altering the conventional, continuous tread ribs to include terminals at approximately every half inch in the crevice between the ribs. Reduction of heat is accomplished by a completely ventilated shoulder on each tire instead of the conventional unbroken rib-type shoulder. Despite the apparently jagged or wavy nature of the ribs, according to Goodyear, the ribs are still continuous.

Program Set for N. Y. Meeting

An interesting program has been arranged for the Fall Meeting of the New York Rubber Group, to be held on October 6 at the Building Trades Club in New York City. The afternoon session, which will start at 4:30 P.M., will feature papers on "Injection Molding of Rubber," by D. F. Fraser, manager, Rubber Division, Monroe Auto Equipment Co., and "Variations of Physical Tests of Elastomers between Different Laboratories," by Capt. H. B. Morris and Capt. C. H. Gerwels, of the Edgewood Arsenal, Maryland. After dinner a paper and a demonstration on the "Incorporation of Carbon Black in GR-S Latex" will be given by Gilbert H. Swart, director of research, General Tire & Rubber Co. Tickets are $2.50 each and may be secured from P. P. Pinto, RUBBER AGE, 250 West 57th St., New York 19, N. Y.

Issue Scrap Rubber Posters

Approximately 5,000 posters designed to acquaint scrap rubber dealers with methods of identification of synthetic tires and other products so that synthetic scrap will be kept apart from regular grades of scrap, have been mailed to the field by the Scrap Rubber Institute of the National Association of Waste Material Dealers, Inc. As noted by the

Don't Mix Branded Synthetic Rubber with your Scrap
Mills Will Reject Your Shipment
You Can Identify Tires and Tubes By Their Markings
SCRAP RUBBER INSTITUTE
1109 Times Building, New York 18, N. Y.

accompanying reproduction, the poster explains how tires and tubes made of synthetic rubber are marked at the source of manufacture for purposes of later identification. The warning that mills will reject scrap shipments if branded synthetic scrap is mixed with normal scrap appears at the head of the poster.

Pennsylvania Adds to Line

The addition of hand-balls and squash-balls to its sporting goods line, which now includes tennis balls and shuttlecocks, has been announced by the Pennsylvania Rubber Co., Jeannette, Penna. Two hand-balls, the Navy ball with a 2¼-inch diameter and the official-size ball, will be produced. The squash ball will be the regulation style. The company has also announced that it produced more tennis balls during the first six months of 1944 than it has produced in any full year since 1941.

Radcliffe With Thompson-Weinman

Robert S. "Bob" Radcliffe, until recently Cleveland representative for the R. T. Vanderbilt Co., and formerly for 17 years on the technical staff of the Pigments Department of E. I. du Pont de Nemours & Co., has been appointed sales promotion manager in the Middle West area for Thompson, Weinman & Co., New York City. Mr. Radcliffe is a graduate of Lafayette College, and holds a Master's Degree from Rice Institute. He will maintain his offices in the Guardian Building, Cleveland.

New Method of Making Tires

A series of experiments which may lead to a new method of tire manufacture has been announced by the Firestone Tire & Rubber Co., Akron. Under this new method, compounded liquid rubber or latex, either natural or synthetic, is used in making both the tire body and the tread. It is spread and dried directly on the cord body fabric, thus eliminating the long and complicated processes of milling solidified rubber and calendering it to the fabric. In making the tread, the necessary compounding materials are first added, then the latex is dried into a firm, solid unit and applied to the tire body. The tires made by this new method do not yet compare in mileage with those made by conventional methods, but results justify continued research.

Set Up Special Laboratory

A new special laboratory to be devoted to physical chemistry research is being set up in Detroit by the Engineering Division of the Chrysler Corporation. The new laboratory, which will be headed by Dr. Orlan McGrew Arnold, formerly a professor of chemistry at Rensselaer Polytechnic Institute, will be equipped with the latest types of instruments and apparatus for molecular and atomic research. Some of this equipment is said to have been designed by Dr. Arnold.

Firestone Arranges Loan

The Firestone Tire & Rubber Co., Akron, has announced an arrangement with the National City Bank of New York for a three-year unsecured revolving credit for $75,000,000 at interest rates ranging from 2 to 2½% in order to take care of any financial requirements for the remainder of the war through the settlement of war contracts and into the period of production for civilian needs. This loan has been undertaken without a government guarantee.

Resume Importation of Ore

The Golwynne Chemicals Corp., New York City, has resumed the importation of Indian magnesite ore from which their "Shamva" Heavy Calcined Magnesia is made. The product they are now bringing in is exactly the same as that which was imported prior to the war. It is amorphous magnesite, very white in color and said to be unusually low in manganese, iron and other impurities.

A brochure entitled, "Hercules Resins Useful in Paper Converting Operations" has been issued by the Synthetics Department, Hercules Powder Co., Wilmington, Del. Although designed with the needs of the paper converter primarily in mind, the data is of interest to all those concerned with resins for any use.

FINANCIAL NEWS

B. F. GOODRICH CO. REPORTS NET INCOME OF $5,244,308

The B. F. Goodrich Co. reports a net income of $5,244,308, which equals 2.5% of their net sales of $206,273,349, for the first six months of 1944. This compares with a net income of $5,573,879, or 3.1% of net sales of $179,161,773, in the first half of last year.

The six months income was after all charges including provision of $32,729,000, for estimated federal and foreign income and excess profits taxes (less postwar credit), and for estimated effect of renegotiation of war contract prices, and after providing a reserve of $2,000,000 for contingencies. Consolidated net income for the corresponding period of 1943 was after provision of $30,773,000 for taxes and a reserve of $4,000,000 for contingencies and estimated net effect of renegotiation.

Earnings per share of common stock, of which there were 1,303,255 shares outstanding on June 30, 1944, were equivalent, after provision for preferred dividend requirements, to $3.23 for the first half of 1944 compared with $3.49 a share a year ago.

Consolidated net sales of $206,273,349 increased 15% over the $179,161,773 reported for the corresponding period of 1943. Sales figures do not include the value of the output of U. S. Government-owned plants operated by the company.

Consolidated balance sheet as of June 30, 1944, showed current assets of $131,516,077 and current liabilities of $52,633,713, giving a ration of 2.5 to 1.

Thermoid Company

First Half: Net profit of $324,073, after the exclusion of minority interest, which is equal to 47c a share on 600,000 common shares, and compares with a net of $319,199, or 57c a share on 475,000 shares, last year. Results of the Joseph Stokes Rubber Co., 99¾% owned, and its wholly-owned subsidiary, Precision Roll and Rubber Co., and the Joseph Stokes Rubber Co., Ltd., not a part of the 1943 figures, are included for the first six months of 1944.

Anaconda Wire & Cable Co.

First Half: Net income of $698,874, which is equal to $1.66 per share of capital stock, and compares with a net of $468,431, or $1.11 a share, in the corresponding period of 1943. The company further stated that, on the basis of information available, no amount is refundable under the renegotiation act with respect to sales for the first half of 1944.

Baldwin Rubber Company

Year Ended June 30: Net profit of $379,492, after provision of $1,127,477 for Federal income and excess profits taxes and a reserve of $100,000 for postwar plant rearrangements, which is equal to $1.20 a share, subject to renegotiation. This compares with a revised net profit of $284,296, or 90c a share, for the preceding year.

Brown Rubber Company

First Half: Net profit of $78,520, after provision of $90,185 for taxes, less postwar refund of $4,615, which is equal to 37c a share on 211,100 capital shares. Total current assets, as of July 1, 1944, amounted to $289,249, including $165,124 in cash, $86,568 in accounts receivable, and $37,557 in inventories, against total current liabilities of $140,682.

Raybestos-Manhattan, Inc.

First Half: Net profit of $880,927, after $3,795,000 was deducted for taxes and $525,000 for postwar and other contingencies, which equals $1.40 a share on common stock. This compares with a net profit of $811,525, or $1.29 a share, after deductions of $3,212,000 for taxes and $375,000 for contingencies, in the same period of 1943.

Monsanto Chemical Co.

First Half: Net income of $2,412,247, after taxes and other charges, but before minority interest was deducted, which compares with $2,877,630 for the same period of last year. This income includes all American subsidiaries except the Laucks companies which were acquired on June 1.

National Rubber Machinery Co.

First Half: Net income of $118,590, which is equal to 77c a share, and which compares with a net of $410,193, or $2.66 a share, for the corresponding period of 1943. Net sales of $2,940,451 compare with $5,673,953 for the same period of last year.

United Carbon Co.

First Half: Net profit of $984,595, which equals $2.47 a share, and which compares with $947,602, or $2.38 a share, for the corresponding period of last year.

Columbian Carbon Co.

First Half: Net earnings of $1,667,870, before provision for renegotiation, which equals $3.10 a share on common stock, and compares with $1,502,365, or $2.80 a share, for the same period of 1943.

GOODYEAR TIRE & RUBBER CO. SHOWS PROFIT OF $7,491,078

A net profit of $7,491,078 for the first half of 1944 is reported by the Goodyear Tire & Rubber Co., Akron. This is equal to $2.89 a common share and compares with a net of $7,348,529, or $2.82 a common share, for the corresponding period a year ago. Net sales were reported as $404,707,818 for the first six months of 1944, an increase of 10.5% over the same period of 1943.

The report pointed out that while renegotiation of war contracts for the year ending December 31, 1943, had not been completely finalized, provision for the settlements of the year 1943 and the first half of 1944 has been made. It was also pointed out that the ratio of current assets to current liabilities is about 3.2 to 1.

O'Sullivan Rubber Co.

First Half: Net income of $169,910, which is equal to 59c a share of subordinated common stock, which compares with a net income of $104,992, or 32c a share, for the first six months of 1943.

Garlock Packing Co.

First Half: Net income of $399,583, which is equal to $1.90 a common share, and compares with a net income of $405,368, or $2.15 a share, for the corresponding period of last year.

Goodrich Receives Contract

The Defense Plant Corp. has announced a contract wtih the B. F. Goodrich Co., Akron, for $150,000 for machinery and equipment to be used at Clarksville, Tenn., where the company has a plant making soles and heels. No comment on the announcement has been made by Goodrich officials.

Buffalo Meets on September 21

The next meeting of the Buffalo Rubber Group has been scheduled for September 21 at the Hotel Westbrook in Buffalo, N. Y. D. F. Fraser, Manager of the Rubber Division of the Monroe Auto Equipment Co., Monroe, Mich., will talk on "A New Type of Injection Molding Process for Rubber and Plastics."

Wartime industrial and technical progress in developing new methods and materials facilitating war production are reflected in the latest edition of the SAE Handbook. It presents 630 pages of new and revised data, particularly standards, specifications and classifications and is available at SAE headquarters, 29 West 39 St., New York 18, N. Y., for $5 per copy.

CHICAGO GROUP HOLDS ANNUAL SUMMER OUTING

The annual summer outing of the Chicago Rubber Group was held on July 22, at the Lincolnshire Country Club in Steger, Ill. One hundred and twenty-five members and guests were on hand to enjoy the facilities and grounds of the Club. The highlight

Charles Wonder (Van Cleef) and Jim Sheridan (N. J. Zinc), co-chairmen of the Chicago outing.

of the afternoon was the usual golf tournament. The Blind Bogey Golf Prize was taken by Jim Sheridan (N. J. Zinc) and Bill Crumpler (Mepham) won the Low Gross Prize. Approximately 80 other prizes were distributed through a drawing after the dinner, which followed the day's festivities.

Charles Wonder (Van Cleef) and Jim Sheridan were co-chairmen of the Committee and were ably assisted by W. H. Lussie (Vanderbilt), R. Elliot (Ideal Roller), and R. Anschutz (Witco). The prizes were made possible through the generous cooperation of the following companies:

Advance Solvents & Chemical Co., L. Albert and Sons, American Zinc Sales Co., Bibb Mfg. Co., Godfrey L. Cabot, Inc., Carter Bell Mfg. Co., Chicago Belting Co., Chicago Cutting Die Co., Cleveland Liner & Mfg. Co., Commerce Petroleum Co., Darling & Co., T. A. Desmond & Co., Douglas P. Johnstone Co., Farrel-Birmingham Co., DuPont, General Atlas Carbon, General Latex & Chemical Co., Great Lakes Solvents, Inc., C. P. Hall Co., Herron & Meyer, J. M. Huber, Inc., Hycar Chemical Co., Kraft Chemical Co., Marbon Corp., Geo. S. Mepham Corp., Midwest Rubber Reclaiming Co., H. Muehlstein & Co.

National Rubber Machinery Co., National-Standard Co., Naugatuck Chemical, N. J. Zinc Sales Co., Philadelphia Rubber Works, Pequanoc Rubber Co., Pittsburgh Plate Glass Co., Rex-Hide Co., RUBBER AGE, Henry L. Scott Co., A. Schulman, Inc., Sherwin-Williams Co., Standard Chemical Co., Stanco Distributors, Inc., Sun Oil Co., Thiokol Corp., Titanium Pigments Corp., United Carbon Co., U. S. Rubber Reclaiming Co., R. T. Vanderbilt Co., Wilmington Chemical Co., Witco Chemical Co., and Xylos Rubber Co.

Veteran Reemployment Plans

New divisions to provide jobs for all qualified veterans returning from the armed forces have been set up by the Firestone Tire & Rubber Co. and the B. F. Goodrich Co. at Akron. Members of the reemployment divisions interview each veteran and study his record and experience since he entered the armed forces, with a view to returning him to his former job or to another job for which he has become better fitted. They will recognize special training, special aptitudes and leadership qualities developed in the service and will take full advantage of these service-acquired abilities. At Goodrich, Ernest P. Weckesser, who has been handling selective service problems for that company for the past year, has been appointed administrator of the new reemployment unit. Special training for returned veterans and the hiring of veterans not previously employed by Goodrich are part of the special program.

Rubber Conservation Course

A rubber conservation course, designed to bring the rubber industry and the U. S. Army Air Forces closer together in rubber conservation in all theaters of war, is currently being given at the Goodyear Tire & Rubber Co. plant in Akron, Ohio. The course, scheduled to run for 10 days, will have instructors and lecturers supplied by all the major rubber companies in the Akron area. In addition to lectures and demonstrations, tours of various rubber plants in Akron are a part of the course curriculum. The 75 students selected for the course are men with previous experience in rubber, who are to be assigned as staff officers in various war theaters to superintend and direct all repair work involving rubber products, as well as being in charge of rubber conservation efforts. It has been disclosed that the course was set up upon the direct request of General Arnold, commanding General of the U. S. Army Air Forces.

Moves Offices to Bedford

The Virginia Rubatex Division of Great American Industries, Inc., has transferred its sales offices from New York City to its factory at Bedford, Va. The change was made to facilitate and expedite all activities between customers and the factory.

NORTHERN CALIFORNIA GROUP ENJOYS ITS SECOND OUTING

Approximately 140 members and guests attended the second annual outing of the Northern California Rubber Group held on August 6 at Tilden Regional Park in Berkeley, Calif. The outing was staged under the able direction of Frank Durbin (Shell Chemical) and was thoroughly enjoyed by all of the participants.

Some thirty members entered the golf tournament, the highlite of the day, with low score and blind bogey honors going to Ed Munier (Oliver Tire) and the hole-in-one trophy to Fred Swain (Pioneer Rubber Mills). Mr. Munier also took top honors in the dart throwing contest. Other events included a scavenger hunt, won by the wife of Leonard Boller (Pioneer Rubber Mills); a horseshoe pitching contest, won by Gene Foubert (Plant Rubber & Asbestos Works); and an egg-throwing contest, won by Russell Kettering (Oliver Tire). The swimming contest was won by William Armstrong (American Rubber Manufacturing), with Herman Jordan (DuPont) as runner-up. A guessing contest went to Miss Joan Logett, a guest.

Numerous prizes were distributed for various events, with almost everyone participating securing one. These prizes were made possible by donations received from the following companies:

American Rubber Mfg. Co., L. H. Butcher Co., California Cotton Mills, DuPont, Farrel-Birmingham Co., Goodyear Rubber Co., C. P. Hall Co., Hycar Chemical Co., Imperial Paper & Color Corp., Marine Magnesium Products Corp., Martin, Hoyt & Milne, Naugatuck Chemical, N. J. Zinc Co., Oliver Tire & Rubber Co., Oronite Chemical Co., Pacific Rubber & Tire Mfg. Co., Pioneer Rubber Mills, Plant Rubber & Asbestos Works, Reliance Rubber Co., H. M. Royal, Inc., Shell Chemical Co., Shell Development Co., Shell Oil Co., Stanco Distributors, Inc., Standard Oil Co., Thiokol Corp., and the R. T. Vanderbilt Co.

Synthetic Foamex Available

Foamex, the latex foam material introduced by the Firestone Tire & Rubber Co., Akron, a few years ago is now being produced from synthetic latex. The synthetic product is soft but can also be produced in medium and firm densities. The new Foamex is extremely light, washable and sanitary, and unattractive to moths or vermin. Its tensile strength is equal to or greater than that made with natural latex, and it can be made to remain flexible at temperatures ranging down to —40°F. When soaked in gasoline, synthetic Foamex increases slightly in volume, but returns to normal when dry. Oil has little effect on it.

LOS ANGELES NEWS

The Goodyear Tire & Rubber Company will sponsor the first monthly supper meeting of the new season of the Los Angeles Rubber Group, Inc., which will be held at the usual meeting place, the Rainbow Room in the Mayfair Hotel, on October 3.

A feature of the program will be the showing of the moving pictures taken at the summer outing at the Uplifters' Club. Interest also centers in the return for an appearance on the program of Paul Beebe, who was president of the group exactly ten years ago. Mr. Beebe is now manager of process development at Akron and has hosts of friends in Los Angeles who will be glad to welcome him "home." Phil Drew, chief chemist at the Los Angeles plant, will also be on the program dealing with a technical subject, as will Mr. Beebe.

"Dent" Sanford, the new vice-president of Goodyear, will be present and will speak briefly as will also F. A. Steele, general superintendent of the Los Angeles plant.

The main speaker of the evening has not been named at this writing. Presiding will be Charley Roese, past president of the club, also a Goodyear executive.

This is the first supper meeting since the June meeting and it is anticipated that a record attendance will be on hand.

Ed Royal, of H .M. Royal, Inc., Los Angeles, has returned from Trenton, N. J., where he, accompanied by his two brothers, went with the body of his mother, Mrs. Minnie Stokes Royal, 80, who passed away in Los Angeles on August 5. Mrs. Royal, whose original home was in Trenton, had lived in Los Angeles for seventeen years. She had been ill only a few weeks. Survivors include the three sons—Edward L. Royal of Los Angeles, H. M. Royal of Trenton, and J. S. Royal of Chicago; a brother-in-law and sister, Mr. and Mrs. Harry L. Boyle, of Los Angeles (Mr. Boyle was formerly with the Joseph Stokes Rubber Company of Trenton); and a brother, Charles E. Stokes, president of the Home Rubber Company of Trenton.

M. A. Belcher, general manager of the Beaurepaire Tire Service Company, Melbourne, Australia, after spending a number of days in the Los Angeles area, during which time he visited the synthetic rubber plants, left by train for San Francisco early in September preparatory to taking a plane for his home country. Mr. Belcher was one of a group of prominent Australian rubber men touring the country visiting various rubber plants.

Fred S. Carpenter is the new factory manager of the synthetic rubber division of the U. S. Rubber Company in Los Angeles, succeeding A. L. Jury. Mr. Carpenter is no stranger to Los Angeles as he was connected with the U. S. Rubber Company plant here for several years. He comes back from New York where he has held an executive position with the company for some time.

The post-war rubber industry in Los Angeles will offer unlimited opportunities for employment, according to published announcements by executives of the local major rubber plants. In a statement issued by John M. Miller, plant manager for the U. S. Rubber Company, the rubber industry here will really be on the march when peace comes. When all new tire building machinery has been installed there will be need for about 3,654 additional workers, he pointed out.

The rubber industry, he stated, because of war conditions, has compressed 50 years of industrial research into two years and the benefits of that progress will grow when the war ends. To meet the expanding industrial opportunity every rubber plant in Los Angeles has instituted expansion programs which are aimed at the breaking of the production bottleneck and preparation for a post-war surge on the Pacific coast, Mr. Miller stated.

"Los Angeles," says Mr. Miller, "provides an adequate source of raw materials right in our backyard and this fact establishes a self-sustained rubber industry wherein a tire can be grown from California's soil up to the finished product."

In the recruitment of 1,100 workers for the rubber industry, representatives of the "Big Four" addressed members of the Junior Chamber of Commerce on August 30, seeking the aid of that organization in the recruiting drive. T. S. Mick of Goodyear, P. R. Levering of Goodrich, C. L. Smith of Firestone and R. E. Behrman of U. S. Rubber, each presented a separate phase of the rubber industry's problem to the "juniors."

George Steinbach of H. M. Royal, Inc., left early in September for a business trip to Trenton, N. J., and New York City. Mr. Steinbach was to be gone a month and en route he was to stop at Baton Rouge, Louisiana.

Dr. R. P. Dinsmore, vice-president of the Goodyear Tire & Rubber Company, in charge of research, was a recent visitor in Los Angeles.

LOS ANGELES GROUP OUTING FEATURES "DAY IN THE ARMY"

The annual outings of the Los Angeles Rubber Group are always a high spot in the activities of that progressive group. This year's outing was no exception. Held on July 22 and 23 at the Uplifters' Club in Santa Monica, California, with approximately 120 members and guests attending, the outing featured a "day in the army." None of the trimmings was omitted, with army regulations more-or-less adhered to throughout the proceedings, as the accompanying photographs indicate.

The outing got under way on Saturday afternoon, July 22. As members and guests arrived at the club they were formally "inducted," outfitted with "fatigue uniforms" and supplied with equipment. Each "recruit" was carefully examined by a special board of examiners. Lou Konig did an outstanding job as a "guide sergeant." Mess call that evening brought the boys to the kind of meal every G.I. Joe dreams about—thick and tender steaks, with all of the accessories. Following dinner, a game period was held, featuring three horse races, and the betting was wild. Three war movies were then shown, after which taps was blown. It is rumored that taps was not taken too seriously.

Reveille was sounded at 7:30 the following morning, Sunday, July 23, and breakfast preparation was highlighted by the artistry of George Steinbach (H. M. Royal) at his favorite pastime of egg-breaking. It is alleged that it was simply coincidence that one of the eggs happened to be in the hip pocket of Walter Boswell (Thiokol). After breakfast the day's activities soon got into full swing, with various events well managed by committeemen in charge.

Chuck Lamb (Lamb Rubber) won the golf pitch, with Harry Legman, C. McCormick, Dave Good (U. S. Rubber) and Bill Vonder Reith (Sierra Rubber) trailing in that order. Paige Parker (Voit Rubber) won the horseshoe pitching contest, with R. W. Hemmin second best. Elwood Lawless beat Paige Parker in the ping-pong finals. Tennis honors went to Howard Chamberlin (Kirkhill Rubber), with Bert Biheller (Muehlstein) and Dave Wineman as runners-up.

The badminton matches ended up with Don Carr (Plastic & Rubber Products), Joe Larkin and Bill Vonder Reith in that order. The egg toss went to the team of Steinbach and Knudsen, with Carlson and Vodra second and Dietrich and Shapiro third. One of the last events of the day was a novelty contest called "Blind Drill," with orders barked in staccato fashion to the blindfolded company. Winners of this "Where-Am-I" gag were A. H. Subrin, Fred Woerner and Bill Shawger.

After the last of these events, inter-

spersed with swimming and other diversions, a Dutch lunch was served. During lunch a group weight guessing contest was held, won by Craig McCormick. Following lunch a stirring patriotic address was given by "Senator" Murphy, and prizes were generously distributed, everybody receiving at least one prize. As a final touch, a court martial was held to determine the punishment of some of the "bad boys" of the camp. Lou Konig, Harold Dunbar, Monty Montgomery, Red Humphreys and Bill Orth were among those haled before the tribunal to answer some of the grave offenses.

In all, the outing provided twenty-four hours leave from daily cares and was packed with fun every minute of the time. It was an outing which will often be recalled by the members of the "brave little band" which spent one day in the Army. Although numerous members of the group had a hand in the success of the outing, special credit is due to the officers, including Messrs. Pickard, Reinke, Hutchinson, Boswell and Wolter.

Distribution of prizes at the outing, which will long be remembered by the "inductees," was made possible by donations received from the following companies: American Turpentine & Tar Co., Binney & Smith Co., L. H. Butcher Co., Godfrey L. Cabot, Inc., T. A. Desmond & Co., Dill Mfg. Co., B. E. Dougherty Co., DuPont, Farrel-Birmingham Co., Inc., General Atlas Carbon, C. P. Hall Co., W. C. Hardesty Co., J. M. Huber, Inc., Hycar Chemical Co., Hercules Powder Co., A. Legman & Son.

Marine Magnesium Products Corp., Martin, Hoyt & Milne, Monsanto Chemical Co., H. Muehlstein & Co., N. J. Zinc Co., National-Standard Co., Reinke, Hiller & Amende, Inc., H. M. Royal, Inc., E. L. Royal, A. Schrader's Son, Henry L. Scott Co., Stamford Rubber Supply Co., Stanco Distributors, Inc., Thiokol Corp., United Carbon Co., R. T. Vanderbilt Co., Weep, Meldowner & Martin, Inc., Western Shade Cloth Co., Western Insulated Wire, Inc., Chas. T. Wilson Co., Inc.

TOP, left to right: Induction center at Camp Tlargi; W. B. Higbee (Southwestern Rubber) gets his equipment; Cot inspection by "Col." T. Kirk Hill (Kirkhill Rubber). CENTER, left to right: Photo finish of one of the horse races; Ex-chairman Charles Roese (Goodyear) taking his physical; One of the more "serious" sessions, devoted to strategical problems. BOTTOM, left to right: R. E. Hutchinson (Firestone), W. R. Hucks (Rubber Reserve) and Chairman A. L. Pickard (Braun Corp.) in all their finery; Chairman Pickard convinces a couple of recruits that their uniforms are perfect fits; Periods of relaxation like this were welcomed by the weary "G. I. Joes."

CANADIAN NEWS

The stripping and drying of milkweed leaves for experimental production of rubber has been one of the contributions made to the national war effort by rural Canadian school pupils, according to a survey of Canadian schools and universities in wartime recently made by the Wartime Information Board.

Outlining extra-curricular activities carried on during the war by Canadian schools, the survey states that in the fall of 1943, Ontario teachers and students in rural areas made this contribution when thousands of pounds of milkweed leaves were collected by the students. With the cooperation of the Department of Education, the Department of Agriculture organized rural school children and teachers along with farmers in a campaign to collect milkweed. Pupils in rural schools cooperated by stripping the leaves, drying them at home and taking them to school.

Teachers were made responsible for assembling the material, weighing it and attending to its transportation to central points. The district school inspector then forwarded the material to Ottawa where the National Research Council established a pilot plant to conduct experiments. Collection of the material began early in August and continued well into the autumn.

The government paid for the material at the rate of three cents a pound plus a small bonus for especially dry, high quality material. Checks were sent to the inspector to be distributed to each teacher. The money was used for school purposes, the Red Cross or, in a few cases, paid to the individual pupil at the discretion of the teacher.

Golf played in the postwar period with balls having a compressed air center, a synthetic rubber tape winding, and a plastic cover is predicted. According to a recent transatlantic edition of the *London Daily Mail*, British manufacturers believe that rubber will be available to allow golf balls of the 1939 standard to be produced, but others are of the opinion that plastics and synthetics will be introduced.

Patents have been taken out for synthetic rubber tape suitable for winding golf balls and experiments are being made with plastics. Scientists and chemists employed by big golf ball manufacturers, now engaged in war research, have learned a lot about synthetics and plastics which may be applied to golf ball production. If synthetics and plastics are used the rules of golf may have to be revised. At present the size and weight of the ball is limited to not less than 1.62 inches in diameter and not more than 1.62 ounces in weight. Generally, synthetic weighs more than rubber and it might be difficult to keep within the prescribed size and weight.

Eight men were injured, five of them requiring hospital treatment, when fire broke out on August 28 in the light ends recovery unit of the synthetic rubber plant at Sarnia, Ontario. All of the injured were employees of the St. Clair Processing Corporation which operates the damaged unit. Indications were that the damage to the equipment was of a comparatively moderate character, although large quantities of gases had to be discharged in the interests of safety when the trouble occurred. The unit was expected to be shut down for several days pending repairs but all the other units of the synthetic rubber plant continued to operate.

H. L. Blachford, Ltd., of Montreal and Toronto, has announced the manufacture in Canada of Rubber Accelerator Z.E. (zinc diethyl dithio carbamate) for use in GR-S. This accelerator is said to give faster curing and safer stocks at lower costs.

Seiberling Rubber Company of Canada is planning to sell through Harrison & Co., Toronto, a new issue of $500,000 first closed mortgage bonds. The issue will consist of 1 to 5-year serial 3½% bonds with $20,000 maturing each year and $400,000 of 5% sinking fund bonds maturing September 1, 1959. The bonds are expected to be offered at 100 and it is reported that the serial bonds are already sold. The company is controlled by Seiberling Rubber Co. of Akron, Ohio. Its capitalization, prior to this issue, consisted of an authorized issue of 50,000 shares of no par value common stock of which 31,315 shares were issued and outstanding. Seiberling of Canada manufactures tires, tubes, and other rubber products.

York Knitting Mills, Ltd., Toronto, has purchased the former Woodstock Rubber Co. building in Woodstock, Ont., but has made no announcement regarding the use to be made of it. Aviv Textiles, Ltd., has purchased part of the old Dominion Rubber Co. plant at Granby, Que., and will use it as a woolen mill.

Joins Precision Scientific

H. H. Bashore

H. H. Bashore, formerly development engineer for the U. S. Asbestos Division of Raybestos-Manhattan, Inc., Manheim, Penna., has been appointed head of the Rubber & Plastics Division of the Technical Sales & Service Department of the Precision Scientific Co., Chicago, Ill. Mr. Bashore's diversified background embraces many phases of rubber and plastics manufacturing and testing. Among his former connections were American Abrasive Metals, U. S. Rubber Co., and Vulcanized Rubber Co. He has developed the Bashore Resiliometer, the Bashore Puncture-Tear Tester, and the Bashore Hose Flexing Tester during his years in the rubber industry. Mr. Bashore attended Akron University in Ohio and is a member of the Rubber Division, A.C.S., the S.A.E., and other technical organizations.

Imperial Institute Report

Since the loss of crude rubber plantations in the Far East, the Imperial Institute of England has helped to make full use of natural rubber resources elsewhere. According to the latest annual report, the British Ministry of Supply has set up its own washing depots to handle wild rubber and the Imperial Institute has provided the staff to grade the washed rubber. A special method of grading developed by the Institute has been in use for over a year and is expected to lay the foundation of a more scientific grading system. In addition, a long-term research program has been prepared to obtain improvements in the quality of plantation rubber, although for the time being work is being confined to specifying and devising methods of determining improvements. The second stage, according to the report, will include the study of rubber from individual trees with a view to developing progeny with the required characteristics.

OBITUARIES

William B. Marvin

William B. Marvin, secretary of the Farrel-Birmingham Co., Inc., of Ansonia, Conn., died on August 13, after a short illness.

Mr. Marvin was connected with Farrel-Birmingham for 39 years, having entered the employ of the Birmingham Iron Foundry in 1905. He was treasurer of the latter firm at the time of the amalgamation of the Farrel and Birmingham companies in 1927. He then became assistant secretary and director of the new company, and after serving sixteen years in that capacity, was elected secretary in April, 1943, a post which he held at the time of his death. Because most of his time was devoted to the sales end of the business, he enjoyed a very wide customer acquaintance in the rubber and plastics industries.

Mr. Marvin was born in Wilton, Conn., on May 17, 1880, and was a direct descendant of one of the original settlers of Hartford, Conn., in 1635. He was a resident of Ansonia, Conn., for many years, where he took an active interest in civic affairs and community organizations. He was a member of the First Congregational Church, and at the time of his death was a member of the Board of Trustees. He had previously served for several years on the Ansonia Board of Education, and was a past president of the Ansonia Rotary Club. He was a 32nd degree Mason, member of George Washington Lodge, A. F. and A. M., Mount Vernon Chapter R.A.M. of Ansonia, Union Council, R. and S. M., and New Haven Commandery, Knights Templar.

Funeral services were held at his home in Ansonia, on August 16. A widow, a son, and a daughter survive.

Carl H. Rupprecht

Carl H. Rupprecht, general manager of the pigments department of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., died on September 10, at the Orange Memorial Hospital, Orange, N. J., after an illness of several months. He was 57 years of age.

Throughout his business life, Mr. Rupprecht was connected with the pigments and dry colors industry. He started with the Fred L. Lavanburg Co. of New York, rising to assistant sales director. He joined DuPont in 1917, and in 1924, after several promotions, was transferred to Wilmington, as general sales manager for the lithophone, dry color and pigment division of the company. In 1930, he was made manager of the pigments division of DuPont and a year later was elected president of the Krebs Pigment and Color Corp., a subsidiary, now the DuPont Pigments Department.

A bachelor, Mr. Rupprecht is survived by two brothers.

William A. Anderson

William A. Anderson, president of the John A. Roebling's Sons Co. of Trenton, N. J., died at his home on September 10 in Princeton, N. J., after an illness of two months, at the age of 74.

Born in Trenton, Mr. Anderson spent five years at the Lawrenceville School in Princeton, and then entered the employ of the Roebling firm as a timekeeper. He progressed steadily in the organization, with which he remained throughout his career. After serving as vice-president, treasurer and general manager for several years, he was elected president of the firm in 1936, following the death of Ferdinand W. Roebling, Jr. This marked the first time in the company's history that anyone not a member of the Roebling family held that office. Mr. Anderson also was a director of the Otis Elevator Co. and the Delaware and Hudson Co.

Funeral services were held on September 13, in the Trinity Episcopal Cathedral, Trenton, and burial took place in the Ewing Church Cemetery, Ewing Township, near Trenton. A widow survives.

William H. Chapman

William H. Chapman, inventor of the Chapman electric neutralizer, widely used in the textile, printing, leather, rubber, and other industries, and manufactured and sold by the Chapman Electric Neutralizer Co., Portland, Maine, died on August 28. He was 85 years of age. Mr. Chapman also held patents on numerous other industrial devices. Born in Blackinton, Mass., Mr. Chapman was graduated from Williams College in 1881, and built the instruments used in the physics courses at Middlebury College.

The War Department has issued a booklet under the title of "Adjustment of Production Cut-Backs," which outlines, simply and graphically, the careful consideration and detailed planning that the Army accords to any necessary reduction in production programs and resultant cancellation of contracts.

Ramon B. Luigi

Ramon B. Luigi, associated with the Rubber Development Corp. in Brazil, died on August 10, at Johns Hopkins Hospital, Baltimore, Md., following an operation. He was 45 years of age. Mr. Luigi was born in Trinidad and later became an American citizen. He was on a leave of absence from the Washburn Crosby Co., manufacturers of flour, with whom he had served as traveling representative in the West Indies, Central and South America before joining the Rubber Development Corp. He was a graduate of Queen's Royal College, Trinidad, and also studied at Columbia University.

U. S. Rubber has revealed that one of its plants alone has produced more than 4,178,000,000 single conductor footage of wire in the past two and one-half years, of which more than 2,567,000,000 feet was of the assault type used as a conductor in all front line communications work.

The reaction of some users of all-synthetic Silvertown tires is told by Goodrich in a new booklet entitled "Here's What Users Say." Excerpts from letters received from various parts of the country are reproduced.

Ventilated ear plugs of soft rubber, filled with granular sound-absorbent material, which permit workers to hear ordinary conversation but shut out ear-damaging and fatiguing production noise, have been introduced by the Safety Ear Protector Co., 448 So. Hill St., Los Angeles 13, Calif.

A new guarantee plan, representing a three-way guarantee, has been established on its tires by the Pharis Tire & Rubber Co., Newark, Ohio. These include a 90-day free replacement of the tire if it fails for any reason at all, a 24-month guarantee on a pro rata basis on S-3 tires, and the regular manufacturers' standard warranty.

A non-skid walkway coating material for airplanes, known as "Flight Floor," has been developed by the Glenn L. Martin Co., Baltimore, Md. The new material weighs only 47.5 grams per square foot as compared with 232.1 grams for the rubber matting previously used. The principal ingredients of "Flight Floor" are Thiokol and ground cork.

Goodrich has announced a reduction of approximately 2c a pound on its recently-introduced line of Geon polyvinyl resins. On carload lots of 30,000 pounds or more the reduction ranges from 4 to 5%.

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NEWARK, N. J.—Chas. S. Wood & Co., Inc.
PORTLAND, ORE.—Miller & Zehrung Chemical Co.
ST. PAUL, MINN.—George C. Brandt, Inc.
SEATTLE, WASH.—Carl F. Miller & Co.
TRENTON, N. J.—General Supply & Chemical Co.

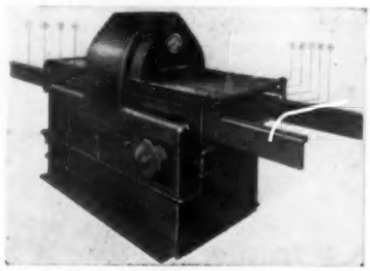
NEW EQUIPMENT

Stereotex Hydraulic Press

A new type hydraulic press, which features preheating, chilling and molding in a single unit, has been introduced by the Stereotex Machinery Co., Stamford, Conn. Although primarily designed for the production of plastics, the new press is also suitable for the manufacture of rubber printing plates and stereotype matrices.

The main ram of the new Stereotex press is water-cooled, permitting close tolerance between the rams and sidewalls of the cylinders. The hydraulic system is fully automatic and consists of the press proper, a V-type rotary pump, flange mounted on a constant-speed motor, a filling check valve, solenoid-operated four-way valves, sequence valves and pressure control valves, with push buttons and an automatic timer controlling the operation. The form sliding plates of the press are interchangeable and are made of a process thin steel that is not subject to warping. The heating system is self-contained and can be operated by gas or electricity.

Pressure capacity of the new press varies with the three models available, these models handling 300, 500 and 800 tons, respectively. In the 500-ton press,



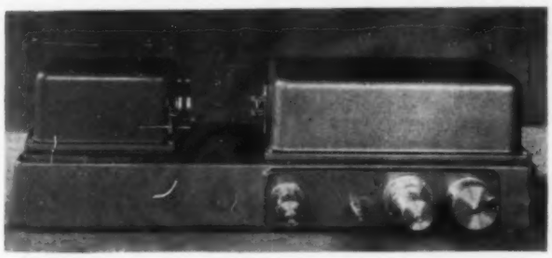
for example, the pressure capacity per square inch on the ram is 1,250 pounds, and features include a 32-inch ram, 31¼ x 32-inch platen, and a 5 h.p. motor. This model has an overall length of 96 inches, width of 51 inches, height of 65 inches, and weighs approximately 18,800 pounds. The cylinder and frame of all models are cast in one self-supporting piece, forming a yoke for the top platen.

When used in the production of rubber printing plates, the platens of the chilling press are in "low" position. The form assemblies are fed through the machine from the rear, instead of the front, onto a portable table supporting the sliding plate between the front track extension. Then the molding press closes, heating the pre-heated form assembly from top to bottom and exerting the required gentle pressure. Simultaneously the "pre-heating" press closes, heating another form assembly and exerting the required pressure for the second half of the curing period.

After holding the gentle pressure of the molding press for 20 or 30 seconds, it is slowly increased until the bearer become tight. At the end of a five-minute timing period, the timer releases the pressure, opens the presses, resets itself for operation, and rings a signal indicating the end of the semi-cure in the molding press and the final cure in the "pre-heating" press.

All-Purpose Infrared Spectrometer

An all-purpose infrared spectrometer, known as Model 12-A, which takes full advantage of both the qualitative and quantitative aspects of infrared spectroscopy, has been introduced by the Perkin-

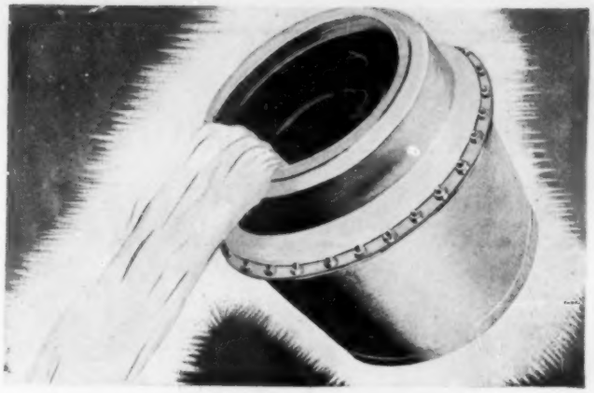


Elmer Corp., Glenbrook, Conn. By appropriate choice of prism materials sufficient resolution is obtainable with the new instrument for research work throughout the spectrum from 1 to 25 μ. Although the instrument may be manually operated, provision is made for automatic drive and synchronized spectral recording where the volume of work requires this feature. Moreover, a turret stop mechanism permitting rapid selection of predetermined wavelengths, together with source stability and accurate mechanical controls, makes possible rapid, reproducible measurements for analytical work.

Measuring only 31 x 11 x 9 inches, the new spectrometer requires limited housing space and may be transported easily from the laboratory to the site of chemical operation if desired. The optical parts are enclosed in two air-tight cases, while the intermediate space allows easy access to the radiation path for solid, liquid or vapor (up to 10 cm.) absorption cells. For cases where small gas concentrations are desired, the smaller housing can be made vacuum tight. It is tapped for inlet and outlet tubes to form a 40 cm. absorption path for static or dynamic sample measurement. The controls are grouped on a single panel.

FOR EASY PROCESSING USE PHILBLACK A

(FOR FURTHER DETAILS, SEE AD ON PAGE 534)



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Such action may well relieve you of one of your current emergency problems.

•

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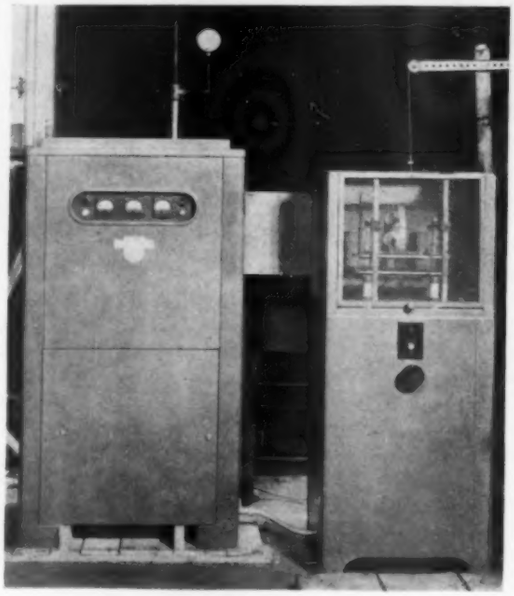
Originators of the Capitol Process Liner Treatment

Model M-200 Generator

Dielectric heating, already responsible for speeding-up production in the manufacturing of plastic, plywood, laminated and other products, is opening up new possibilities for improved products in the



fields of rubber, paper, ceramics, etc. Illustrated herewith is a new 3½ k.w. generator for the heating and drying of dielectric materials recently introduced by the Induction Heating Corp., 389 Lafayette St., New York 3, N. Y. Called Model M-200, the new generator has a frequency of 20 megacycles. It operates from 205-245 volt, 60 cycle, single phase line, and has a full load input of approximately 9 KV-A and a power factor of 90%. Unlike most other types of generators, this equipment can be separate from the electrodes so that greater efficiency and plant layout may be obtained.

A **self-flaring couple** for flexible plastic tubing has been announced by the Packless Metal Products Corp., New Rochelle, N. Y. No flaring tools are required, the flare being formed as the members of the coupling are screwed together in one simple operation. The plastic tubing is not preheated.

The completion of a new 16-ounce capacity **plastics injection molding machine** has been announced by the Hydraulic Press Mfg. Co., Mount Gilead, Ohio. The new machine is said to incorporate many new design features and to represent one size of a new postwar line of injection molding machines planned by the company.

Electric Machinery Mfg. Co., Minneapolis 13, Minn., has introduced a new line of **large, heavy-duty induction motors** for all types of industrial, power plant, water works and other drives. Motor sizes range from 200 to 1,000 h.p., and are available in squirrel cage and wound rotor models.

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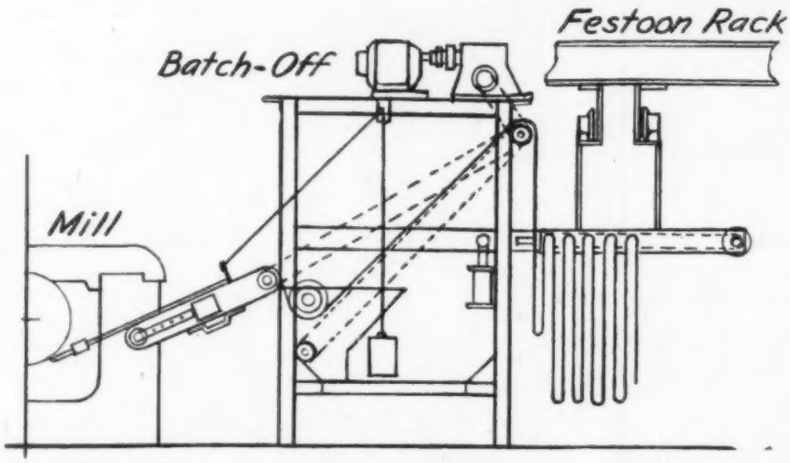
AUTOMATIC MILL BATCH-OFF MACHINE



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1903
SPRINGFIELD, NEW JERSEY

REVIEWS

BOOKS

The History of Rubber Regulation: 1934-1943. Edited by Sir Andrew McFadyean. Published by George Allen & Unwin, Ltd., London, England. Distributed by W. W. Norton & Co., Inc., 70 Fifth Ave., New York, N. Y. 5½ x 8½ in. 240 pp. $3.25.

(*Available from Book Dept.,* RUBBER AGE)

The International Rubber Regulation Committee was organized as a functioning body in May, 1934, for the purpose of instituting a regulation scheme affecting the principal rubber cultivation areas of the world. It was charged with first effecting a reduction in the abnormally large stocks in existence at that time and thereafter to maintain adequate supplies of rubber at a fair and equitable price. How the Committee was organized, how it functioned and the results it achieved is the subject matter of this book, edited by Sir Andrew McFadyean for the Committee. It should be emphasized at this point that the facts are presented in the book; judgment is left to the reader.

Although the book is concerned primarily with the functioning of the committee and a detailed analysis of how decisions concerning cultivation, planting, production, distribution and other factors in the over-all rubber picture were arrived at, it includes some general information necessary to round out the full story. Accordingly, the first four chapters of the book are devoted to a general description of rubber and the rubber industry, previous rubber control schemes, negotiations leading up to the formulation of the new Agreement, and principal provisions of the new Regulation and their application, following which are three chapters devoted to the planting of rubber, research and statistics, and stocks of rubber, respectively. These three chapters furnish background information of special importance to the rubber initiate. The remaining five chapters cover the working of the regulation within specific periods.

Operations of the Regulation Committee of course carried into the current war period and from time to time criticism has been leveled at the Committee in connection with the attempt of the United States to amass a huge emergency stockpile of crude rubber prior to December, 1941. One complete chapter in the book is devoted to the history of the constitution of stocks for war purposes, not only in the United States but in the United Kingdom and Canada as well. The factual matter contained in this chapter, covering the events of the period in question in considerable detail, should serve to still such criticism for all time. Space does not permit a review of all of the factors involved.

The book has twelve chapters in all and an extensive appendix. This appendix includes the complete text of the International Rubber Regulation Agreement, the names of members of the Committee and of the advisory panel, the text of the cotton and rubber barter agreement (June, 1939), and the complete texts of the first, second, third and fourth agreements entered into between the Rubber Reserve Corporation and the Regulation Committee.

The appendix also includes a statistical supplement, containing eleven tables, covering data on total acreage under rubber in regulated areas, new planting and replanting statistics (1934-40), net exports and imports of crude rubber, absorption in importing and producing countries, principal world stocks of rubber (inside and outside of regulated areas), and average prices for rubber in the London and New York markets from 1910 to 1941.

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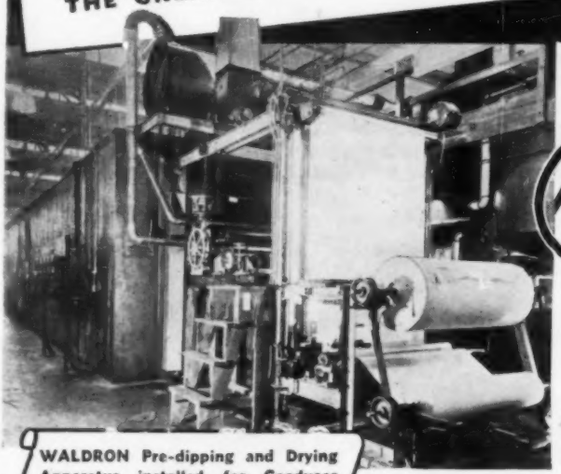

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Exclusive Atlas Twin-Arc Weather-Ometer features:

1. Temperature control.
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8. Control panel contains Volt and Ammeters — Time Meter—Light and Water Cycle switch—Automatic time cut off switch — Voltage adjusting switch — Direct reading thermal regulator — Reactance Coil (cut power cost in half).

The Single Arc Model is a popular machine where high speed is not required.

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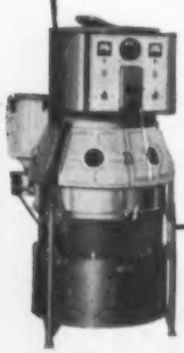

The recognized standard machine of the textile trade for determining the light-fastness of materials. Specimens are rotated around the Atlas Enclosed Violet Carbon Arc—the closest approach to natural sunlight. Temperature of the filtered air is automatically controlled. Proper humidity is furnished by evaporation from a constant-level water reservoir. Available with a wide variety of specimen holders and exposure masks.

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Plastics Molds. By Gordon B. Thayer. Published by American Industrial Publishers, Fairmount-Cedar Bldg., Cleveland 6, Ohio. 6 x 9 in. 136 pp. $2.50.

This is actually the second edition of a practical guide for designers, builders and users of molds for the handling of plastics. The first edition, issued in 1941, was called "Plastics Mold Designing" (see RUBBER AGE, p. 353, August, 1941). In the new edition, the author has incorporated many suggestions by readers and has added other material to bring it abreast of new developments in the field. In addition, contributions by five specialists have been included.

Several other improvements have been made in the new edition of this book. The Nomenclature of Plastics Molding has been considerably enlarged. In response to a number of requests for a check list to cover the major operations in a contract mold shop, a section on Practical Points in Mold Design and Construction has been added. Specific points to be watched by the toolmaker, the molding operator, the finisher, and the inspector, as well as the designer, are covered in this latter section.

This second edition consists of twenty chapters, and includes a subject index. Like the first edition, it should prove of definite value to all designers, manufacturers and users of plastic molds.

●

Cumulative Index for the Chemical Formulary. Compiled by H. Bennett. Published by the Chemical Publishing Co., Inc., 26 Court St., Brooklyn 2, N. Y. 5½ x 8½ in. 164 pp. $4.00.

This index covers all the formulae included in the first six volumes of THE CHEMICAL FORMULARY and indicates at a glance the volume and page number for each item in all six volumes. The material has been arranged in strict alphabetical order to facilitate quick reference, with numerous cross-references included to enable the user to locate the subject desired, formula or process, as easily as possible. Volumes I to VI of the subject work contain approximately 4,000 pages of tested formulae from every important industry. Each volume is sold at $6.00.

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A technical bulletin on its *Duplex Tubing*, covering applications and installation, has been made available by the Bridgeport Brass Co., Bridgeport 2, Conn. The tubing was developed to overcome corrosion problems too severe for a single metal or alloy, such as corrosive oil or vapors on one side and polluted circulating water on the other.

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REVIEWS (CONT'D)

How to Select Foremen and Supervisors. By R. C. Oberdahn. Published by National Foremen's Institute, Inc., Deep River, Conn. 5½ x 8 in. 54 pp. $2.00.

Written primarily for top management, personnel managers and heads of industrial relations departments, this book is a helpful guide to formulating a selection program for foremen. It may also be successfully used by workers and supervisors who would like to make an analysis of themselves for guidance purposes. After treating with the question of what a foreman actually is, the author, who has been engaged in training and selection work for many years, discusses the duties of that individual, and then compares the old and new methods of selecting foremen. Five specific steps to be followed are outlined.

BOOKLETS, CATALOGS, Etc.

Synthetic Rubber: What It Means to America. National Synthetic Rubber Corp., Louisville, Kentucky. 8½ x 11½ in. 40 pp.

In an attempt to bring about a broader realization of what the rubber program means to the average American, what synthetic rubbers have already done for industry, and what reasonably may be anticipated for the future, this booklet has been issued jointly by the five companies participating in the ownership and operation of the National Synthetic Rubber Corp., which operates one of the government-owned copolymer plants at Louisville, Kentucky. These companies are: Goodall Rubber Co., Inc., and Hamilton Rubber Mfg. Co., both of Trenton, N. J., Hewitt Rubber Corp., Buffalo, N. Y., Lee Rubber & Tire Co., Conshohocken, Penna., and Minnesota Mining & Mfg. Co., St. Paul, Minn.

The booklet describes how the five participating companies worked together to organize the operating company, outlines the management of that company, includes excellent photographs of various steps in the manufacture of GR-S at Louisville, discusses the importance of synthetic rubber to America, and contains a chart showing the extreme fluctuations of natural rubber prices in the past. Illustrations of the practical uses of synthetic rubbers as developed by the participating companies in the National Synthetic Rubber Corp. are shown in the booklets issued by the various participants. Copies of the booklet can be secured from any one of the participating companies (above) or from the Louisville company.

•

Hercules Nitrocellulose. Cellulose Products Dept., Hercules Products Co., Inc., Wilmington 99, Delaware. 8½ x 11 in. 54 pp.

This is a basic textbook on the properties and uses of soluble nitrocellulose, the base for plastics, lacquers, coated textiles and many other products. Divided into two parts—properties and uses—it begins with a discussion of the history of nitrocellulose and contains a section which includes chapters on the manufacture, types, solubility, viscosity and other properties of that material. The section on uses discusses application of nitrocellulose in lacquers, coated textiles, plastics, adhesives and inks. Tables in this section show the hardness of lacquer films, nitrocellulose in artificial leather and coated textiles, and typical properties of nitrocellulose plastics.

•

Ty-Ply for Bonding Natural and Synthetic Rubbers to Metal during Vulcanization. (Booklet No. 5B). R. T. Vanderbilt Co., 230 Park Ave., New York, N. Y. 8½ x 11¼ in. 16 pp.

A complete description of Ty-Ply, a non-tacky adhesive recommended for bonding purposes, is given in this booklet, together with suggestions for use. Formulas covering the adhesion of various compounds to steel with Ty-Ply, including compounds containing natural rubber, GR-S, GR-I, GR-M and Buna N, are given, with physical test results shown. The booklet also includes a table of adhesion to various metals with Ty-Ply.

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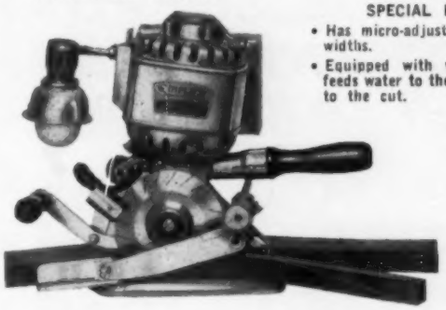
A PORTABLE machine capable of stripping slab rubber up to 1″ thick at the rate of 20,000 feet in 8 hours. Any width desired.



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FRANK E. RANDALL, Waltham, Mass.

The Storage of 1:3 Butadiene (Research Bulletin No. 7.381-C, Second Edition). 8½ x 11 in. 36 pp.
The Storage of Isobutylene (Research Bulletin No. 7.401-B). 8½ x 11 in. 37 pp.
Issued by the Pittsburgh-Des Moines Steel Co., Pittsburgh, Penna.

Four of the most important raw materials in the manufacture of synthetic rubbers are acrylonitrile, 1:3 butadiene, styrene and isobutylene. Because of a lack of previous experience in the storage of these raw materials, special research was undertaken to determine best procedures. The data included in these two bulletins, covering 1:3 butadiene and isobutylene, respectively, was compiled under the supervision of James B. Garner, Ludwig Adams and Robert M. Stuchell of the Chemical Storage Research Fellowship maintained at the Mellon Institute of Industrial Research by the Pittsburgh-Des Moines Steel Co., with the collaboration of the engineering department of that company. The bulletins cover the correct physical and chemical properties of the two materials in question as they affect the safe and economic storage of them, as well as the best container materials, suitable protective coatings, proper storage conditions of temperature and pressure, and the most economical type of storage plant, from the standpoint of initial as well as annual operating costs.

•

Geon Resins and Plastics for Calender and Solution Processing. Chemical Division, B. F. Goodrich Co., Rose Building, Cleveland 15, Ohio. 8½ x 10¾ in. 4 pp.

As indicated by its title, this bulletin discusses Geon vinyl resins and plastics for calender and solution processing. It describes the Geon vinyl chloride polymers and copolymers, in resin as well as plastic form, gives plasticizer and stabilizer tables for use in combination with the resins, discusses fillers and pigments, and lists typical formulations for the calender, spread or dip processes. The bulletin also discusses mixing and milling, calendering and the general aspects of solution coating with the resins.

•

Simplex Synthetic Rubber Insulations. Simplex Wire & Cable Co., Cambridge 39, Mass. 8½ x 10 in. 8 pp.

This is a report to industry on the synthetic rubber insulations developed and adopted by the company for its wires and cables. It is an up-to-date report of rapid progress and the remarkable results attained in the transition during the past few months from natural rubber to synthetic rubber insulations and sheaths for these wires and cables.

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(FOR FURTHER DETAILS, SEE AD ON PAGE 534)

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MARKETS

Rubber – Crude, Reclaimed and Scrap – Cotton – Ducks – Tire Fabrics – Sheetings

NEW YORK, SEPT. 12, 1944

Crude Rubber

THERE has been considerable speculation in recent months as to how long it will take to restore operating efficiency to the plantations in the Far East, once such territory has been wrested from the Japanese. Any predictions made along these lines must be somewhat tempered, since we have no way of knowing in what condition the plantations will be found. It is generally agreed that the greatest danger to the plantations lies in the possibility that they may not have been worked for the past few years and that the jungle may have reclaimed a good portion of the trees, rather than any specific man-inspired damage the Japs may perpetrate.

In this connection a comment made by E. G. Holt, now chief of the Commercial Research Division of the Rubber Development Corp. and former chief of the Leather & Rubber Division of the Bureau of Foreign & Domestic Commerce of the Department of Commerce, is of special interest. Mr. Holt believes it will be at least two years before the average cost of rubber production on estates in Malaya and the Netherlands Indies can regain former low levels, under the best circumstances, even if the trees are undamaged.

There are several reasons for this observation, as Mr. Holt points out. For instance, estate operators will have unusual expenses and problems of re-equipment, reorganization, staff procurement and training, all of which will serve to increase costs in the immediate postwar years. The costs of native producers in the Netherlands Indies, however, will be little influenced by the war, and in Malaya their costs will be less affected than costs on the estates.

Prices shown below are ceilings set by the Rubber Reserve Company.

	C	N-C
Plantations—		
Ribbed Smoked Sheets, 1X	22½	40
Thick Pale Latex Crepe, 1X	22½	40
Thin Pale Latex Crepe, 1X	22½	40
Thick Brown Crepe, 1X	21⅜	38⅞
Thin Brown Crepe, 1X	21⅜	38⅞
Thick Remilled Blankets, #1	21⅜	38⅞
Rolled Brown or Flat Bark	18	35½
Smoked Blankets, #1	21⅛	38⅝
Claro Brand 1XRSS	22½	40
Sole Crepe Trimmings	22	39½
Sole Crepe	22½	40
Wild—		
Uncut Fines, Crude	15	29
Cut Fines, Crude	15½	29¾
Cut Fines, Washed & Dried	22½	40
Upriver Coarse, Crude	12⅜	26⅛
Upriver Coarse, Washed & Dried	20¼	37¾
Caucho Ball, Crude	11⅜	24¾
Caucho Ball, Washed & Dried	19½	37
Guayule—		
Carload Lots	17½	31
Less than Carload Lots	18	31½
Balata—		
Surinam Sheet	42½	42½
Manaos Block	38¾	38¾
Colombian Block	38¾	38¾
Peruvian Prime	38¾	38¾
Chicken Wire	23¾	23¾
Latex—		
Normal, Tank Car Lots	26	43½
Creamed, Tank Car Lots	26¾	44⅛
Centrifuged, Tank Car Lots	27¾	45¼
Heat-Concentrated, Carload Drums	29½	47

C, for Civilian Use; N-C, for Non-Civilian Use.

Scrap Rubber

The major item of interest in the scrap rubber field in recent weeks has been the sale of varied lots of miscellaneous scrap by the Rubber Reserve Corporation from government stockpiles. Included among such transactions was the sale of 3,000 tons from the stockpile maintained at Warren, Ohio. Reclaimers are still primarily interested in tire and tube scrap and some difficulty is anticipated in moving the huge quantities of miscellaneous scrap which was collected during the nation-wide collection campaign some two years ago; therefore, reports of such sales are of exceptional interest. Although synthetic rubber scrap continues to accumulate in scrap channels, better methods of segregation must be found before such scrap can be moved to reclaimers. Prices shown below are ceilings on typical grades of scrap.

(Prices to Consumers, Delivered Akron)

Mixed passenger tires	ton	$20.00
Beadless truck tires	ton	26.00
Mixed truck tires	ton	20.00
Beadless passenger tires	ton	26.00
No. 1 passenger peelings	ton	52.25
No. 1 truck peelings	ton	52.25
No. 2 passenger tubes	lb.	.07¾
Red passenger tubes	lb.	.07½
Black passenger tubes	lb.	.06¾
Mixed passenger tubes	lb.	.06½
No. 2 truck tubes	lb.	.07½
Red truck tubes	lb.	.07¼
Black truck tubes	lb.	.06½
Buffings	ton	35.00
Bicycle tires	ton	15.00
Air bags and water bags	ton	15.00
Boots and shoes	ton	33.00

Tire Fabrics

The situation in the tire fabric field remains unchanged, with practically no deman for such fabrics. Consequently, prices are nominal and in many quarters are not even being quoted. The prices shown below are those which were in force on or about January 15, 1942.

(Prices Net at the Mill)

Peeler, carded, 23/5/3	lb.	.43½ @	.44
Peeler, carded, 23/4/3	lb.	.44½ @	.45
Peeler, carded, 15/3/3	lb.	.41½ @	.42
Peeler, carded, 15/4/2	lb.	.41½ @	.42
Peeler, carded, 13/3/3	lb.	.40½ @	.41
CHAFERS			
Carded, American, 1 1/16"	lb.	.43½ @	.44
Carded, American, 1"	lb.	.39½ @	.48

Sheetings

48x40	36 in.	5.50	lb.	—	@ 7.818
40x40	36 in.	6.15	lb.	—	@ 6.991
40x36	36 in.	6.50	lb.	—	@ 6.615
48x48	40 in.	2.50	lb.	—	@16.200
48x48	40 in.	2.85	lb.	—	@14.210
56x60	40 in.	3.60	lb.	—	@11.944
48x44	40 in.	3.75	lb.	—	@11.066

Note: Prices shown above are ceiling prices set by order of the O.P.A. Quotations are based on an average price of 15-16-inch middling cotton of 20.37c at the ten designated southern markets.

Cotton

The price of middling uplands on the Cotton Exchange has moved in a 57 point range since our last report, high being 22.46, reached on August 18 and again on August 28, and low 21.89 on September 6. The average price for middling uplands for the month of August was 22.11, based on 27 trading days. Prices jumped sharply in mid-August, from 22.05 on August 15 to 22.46, the high spot for the period, on August 18, the jump reflecting Administration price legislation pertaining to cotton price control as well as factors reflecting the CCC sales program for government-owned cotton. A wave of liquidation, accompanied by hedge selling, broke the price advance, the price dropping to 22.10 on August 23. Mill purchasing, however, resulted in another upward trend and again the price advanced to 22.46 on August 28, but renewed commission house liquidation and hedge selling served to halt the advance once more, the price dipping to 21.89 by September 6. Favorable legislative developments in the campaign to boost the cotton loan rate has been instrumental in forcing the price up in the last few days. Quotations for middling uplands on the Exchange follow:

	August 14	September 12		
	Close	High	Low	Close
October	21.24	21.65	21.52	21.63
December	21.06	21.46	21.36	21.45
March	20.84	21.26	21.16	21.24

Reclaimed Rubber

Despite the easier flow of GR-S for many hitherto restricted products, the demand for reclaim continues to hold up exceptionally well. Reclaimers report that demand stems from almost all branches of the field, with heavy demands from camelback and heel and sole manufacturers. Under Amendment No. 5 to R.P.S. 56 (Reclaimed Rubber), maximum prices for reclaimed rubber have been increased one-quarter cent per pound to partially compensate reclaimers for increased costs in scrap rubber, labor, etc. The increase was also permitted on charges for processing scrap rubber furnished by the buyer. New ceilings on typical grades of reclaim follow:

Shoe			
Unwashed	lb.	.07¼ @	.07½
Tube			
Black Tube	lb.	.11½ @	.11¾
Red Tube	lb.	.12¼ @	.12½
Tires			
Black (acid process)	lb.	.07¾ @	.08
Black, selected tires	lb.	.06¾ @	.07
Truck, Heavy Gravity	lb.	.08¾ @	.09
Miscellaneous			
Mechanical blends	lb.	.04¾ @	.05¾
White	lb.	.13¼ @	.13½

Ducks

Enameling (single filling)	lb.	— @	.44¼
Belting and Hose	lb.	— @	.39
Single filling, A grade	lb.	— @	.19¾
Double filling, A grade	lb.	— @	.20¾

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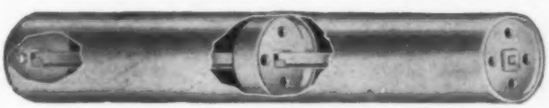

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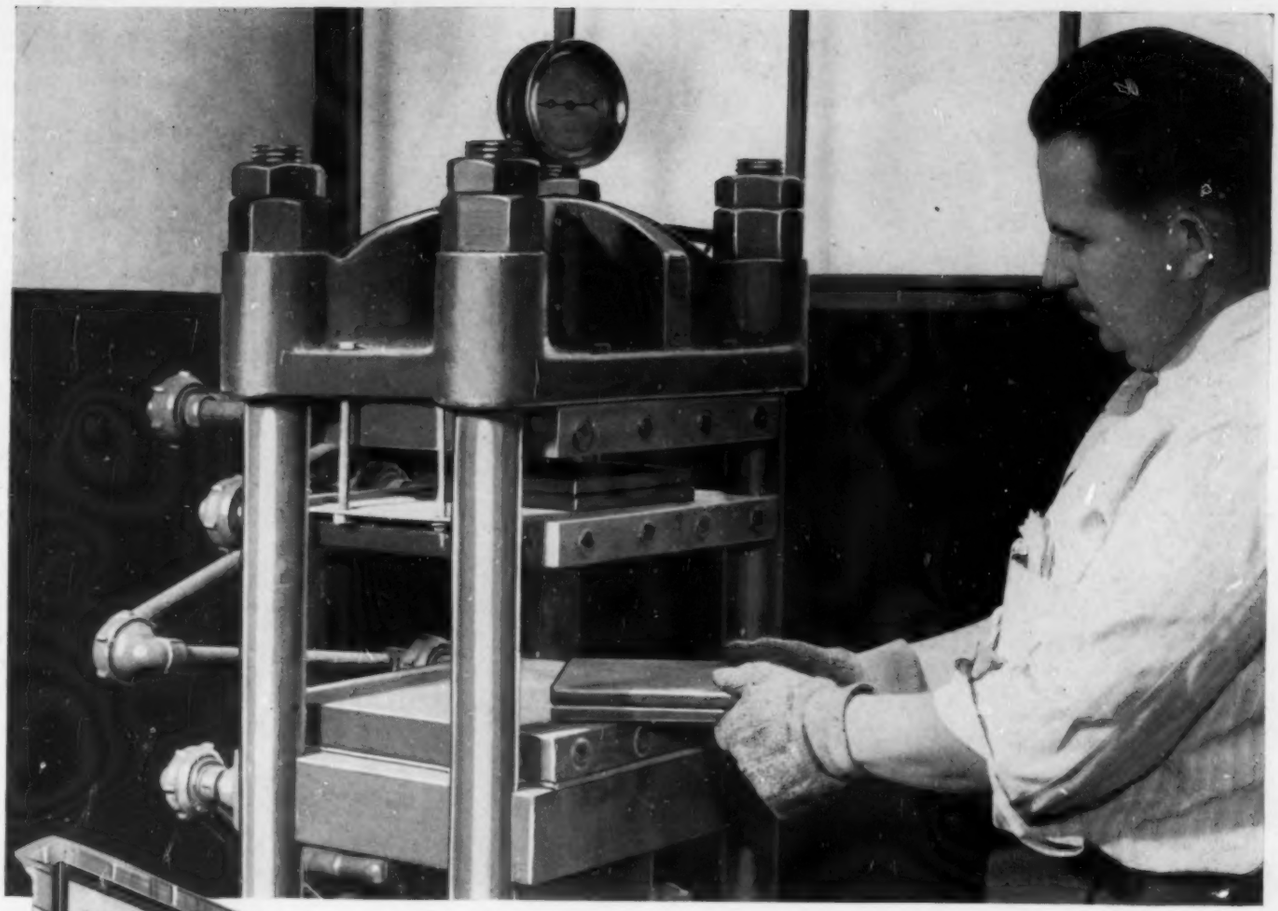

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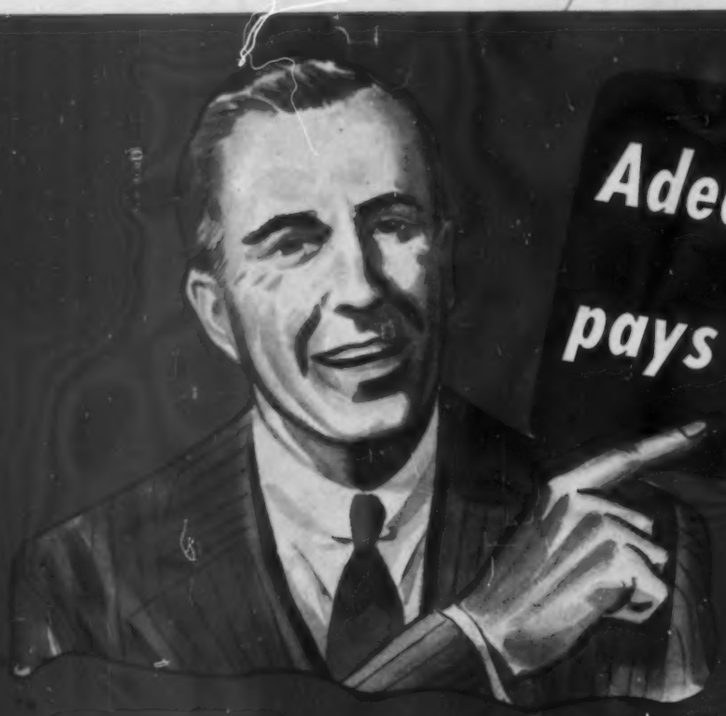
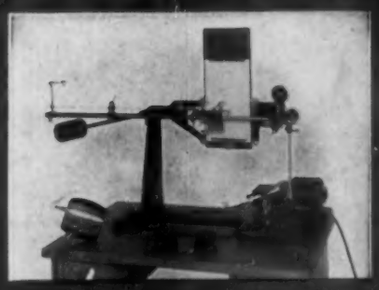


Adequate Testing pays 4 ways!



UTILIZING *Scott Testers to the fullest extent pays off in four distinct ways: by speeding research, facilitating purchasing, promoting production, and proving quality. War's urgency has demonstrated the advantages of adequate testing to countless firms, who will continue to apply those advantages in peace-time operation. Our 60 models span the needs of rubber testing for tensile, hysteresis, twist, flexing, compression-cutting of insulation, plasticity, state-of-cure, adhesion, etc., etc. Results are provided in picturized form, simple to read and ideal to file for record and reference. Circulars upon request.

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